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MEDICAL COLLECTIONS

ON THE

EFFECTS OF COLD,

AS

A REMEDY IN CERTAIN DISEASES.

WITH

AN APPENDIX,

CONTAINING

*An Account of some Experiments made with a View to ascertain
the Effects of COLD WATER upon the Pulse.*

BY

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With crest of gold, should sultry Sirius glare,
And with his kindling tresses scorch the air;—
Nymphs! on light pinion lead your banner'd hosts
High o'er the cliffs of Orkney's gulphy coasts;
To where in azure coif and starry stole,
Grey *Twilight* sits, and rules the slumbering Pole.
There *Nymphs!* alight, array your dazzling powers,
With sudden march alarm the torpid hours;
On ice-built isles expand a thousand sails,
Hinge the strong helms, and catch the frozen gales;
The winged rocks to feverish climates guide,
Where fainting zephyrs pant upon the tide:
While swarthy nations crowd the sultry coast,
Drink the fresh breeze, and hail the floating frost,
Nymphs! veil'd in mist the melting treasures steer,
And cool with arctic snows the tropic year.

BOTANIC GARDEN, Canto 1st.

TO

THE RIGHT HONORABLE

CHARLES BRAGGE BATHURST,

MEMBER OF HIS MAJESTY'S PRIVY COUNCIL,

AND

ONE OF THE REPRESENTATIVES IN PARLIAMENT

FOR THE CITY OF BRISTOL,

THE FOLLOWING PAGES

ARE INSCRIBED,

AS A SMALL TOKEN OF RESPECT FOR HIS CHARACTER,

AND

OF GRATITUDE

FOR THE MOST IMPORTANT OBLIGATIONS,

CONFERRED BY HIM

UPON

THE AUTHOR.

ADVERTISEMENT.

THE following Work was transcribing for the press, before the Second Volume of Dr. Currie's Reports was announced to the Public. Upon receiving this intelligence, its progress was suspended by the Author, partly from an apprehension that it might be so anticipated, as to be rendered useless, and partly from the hope of enriching it with some of the valuable information which he naturally looked for, in a work from the pen of Dr. Currie. In the latter expectation he has not been disappointed. In some instances he had derived his materials from the same sources as the Doctor. In others, he has been indebted to him for many important facts, which are introduced under their proper heads, with a reference to the authority from which they are derived.

P R E F A C E.

IN the Year 1797, the Author of the following pages, in compliance with the laws of the University, where he completed his Medical Education, printed an Inaugural Essay, on the Effects of Cold upon the Human Body. The subject was, at that time, more novel than it is at present; and he was advised to make the second part of his Essay, in which its Medical Effects were particularly considered, the foundation of a larger work, which should collect, under one view, the facts with respect to its operation scattered through a variety of volumes. Different circumstances conspired to prevent the completion of this object during some years; but, in pursuing his Medical Inquiries, he was frequently in the habit

of making notes of any passage which adverted to the subject. By these means the work has insensibly grown to its present size.

After a long period of opposition, the result of exploded and mistaken theories of its operation, the medical application of Cold, has, of late, become comparatively frequent. But it has been observed by an ingenious writer upon this subject, in the *Medical and Physical Journal*,* that even in the present day, "some medical gentlemen complain of the prejudices of mankind as insurmountable obstacles to the practice. But do they not" "he inquires" promote such prejudices by their mode of proceeding? They first declare ingenuously to the connections of the patient, that they wish to employ a remedy entirely new, a remedy which has the appearance of harshness, but on the beneficial effects of which, they have considerable reliance. A preamble of this kind creates prejudices where they did not exist. The affectionate relations are seiz-

* Vol. XI. p. 25.

ed with the same horror, as if a surgical operation on the liver or the spleen were proposed. No assurances of its safety will now prevail upon them, to comply with a practice, the mention of which is forced with qualms from the medical attendant, and that only in a case of extreme necessity." If this picture be just, (and we have no reason to think that it is, in any respect, overcharged,) it may at once tend to sooth the apprehensions of the patient, and to give confidence to the Medical Practitioner, to collect in a small volume, the mass of existing evidence in favour of this remedy. To originality the Author makes no pretensions. His object has been to compile a book of convenient reference, and to spare the trouble of consulting numerous authorities.

In a work which pretends to no higher character, the quotations must necessarily be numerous. Indeed, materials sufficient for a much larger volume were collected ; and he found it a difficult task to avoid the appearance of needlessly swelling the size of the work on the one

hand, or of rendering it a mere index of remarkable facts on the other. He ventures to hope that the extracts from works generally known and accessible, will not be found unnecessarily extended; and that the more diffuse ones will appear to be furnished by those of an opposite description.

BRISTOL, *November 19, 1804.*

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MEDICAL COLLECTIONS.

CHAP. I.

OF THE GENERAL EFFECTS OF COLD UPON THE HUMAN SYSTEM.

IT is sufficiently obvious to the most superficial observation, that Cold has a powerful agency upon the human system.* A few remarks upon the laws of this agency may properly precede the account of its medical operation; nor is this as superfluous as may at first be imagined, for much uncertainty has arisen from the various and contradictory effects which have been ascribed to Cold. By some practical writers it has been classed amongst sedative, by others amongst tonic remedies, and as such, recom-

* I am aware that, it may be more philosophically correct, to consider Cold as a merely negative quality, and to refer its supposed effects to the abstraction of heat.

mended in cases of debility. The illustrious Cullen, to whose acute and penetrating genius, the medical world is under so many obligations, has, in his general view of the treatment of Fever, assigned a place to Cold, as a curative agent, under two classes of a totally different nature. Under the head of those remedies which moderate the violence of reaction, he places it as a sedative. Amongst those which remove the causes, or obviate the effects of debility, by supporting and increasing the action of the heart and arteries, he classes it as a tonic.* In an Inaugural Essay, published at Edinburgh, in 1780, and in many other medical treatises, we find a similar doctrine. If, however, the phenomena of Cold be attentively considered, it appears to me, that this ambiguity will disappear; and that the observer will be led to consider it, in all cases, as a sedative remedy. As it is highly necessary to ascertain its proper character, in order to determine our practical application of it, I shall here briefly state my reasons for adopting this opinion. They are derived,—First, from the paleness and contraction

* First Lines, Sect. cxxxiii. xc. Materia Medica, article Stimulants, and Refrigerants.

of the skin, which succeed the application of Cold.—Secondly, from its diminishing or weakening the action of the heart, and arteries.—Thirdly, from the debility and inactivity observable in the inhabitants of cold countries.—Fourthly, from the gradual diminution of the vital powers, which commences with its first application, and which, if its operation be long continued, terminates in their entire extinction, either in particular parts, or in the whole body.—And lastly, from the accumulated excitability which it induces to the stimulus of heat.

A variety of circumstances may so modify the effects of any given degree of temperature, that it would be impossible to fix the point where actual Cold commences. But, it may be sufficiently accurate for our present purpose, to observe, upon the authority of various writers, that the body constantly retains its natural temperature in a healthy man, when Fahrenheit's thermometer stands at 62 degrees. A temperature inferior to this, unless its operation be counteracted by some mental or corporeal stimulus, gradually abstracts the sensible heat of the body.

The first general effect of this diminished temperature is a paleness of the skin, produced by the contraction of the superficial vessels. If the degree of Cold be considerable, this effect is particularly evident. When Dr. Solander was exposed to the intense frosts of Terra del Fuego, his feet were so contracted, during the slumber of a few minutes, that his shoes fell off when he was compelled to rise.* This is called by Dr. Cullen, its astringent quality.† The epithet is probably misapplied. An extensive system of vessels is reduced to a state of quiescence, and the effect is obvious in proportion to the extent of surface exposed. This exposure causes in a given time, an increased flow of urine, which is supposed by a late eminent Physiologist, to be owing to the diminished action of the cutaneous absorbents, and the inverted motions of those of the bladder. Whatever be the theory of its operation, the fact will admit of important application hereafter.

A second effect of this diminished temperature, is a weakened action of the heart and

* Cook's first Voyage.

† First Lines. Sect. xc.

arteries, which is more particularly obvious, if the Cold applied be either violent in its degree, or long in its duration. This fact is proved by various examples. In cold countries the pulse is uniformly slow. In Greenland it seldom beats above forty strokes in a minute.* Similar effects are produced by the general or partial application of cold water; a decisive example of which is recorded by Dr. Rush, in his account of the Yellow Fever of Philadelphia, in 1793. "In an experiment," says he, "which was made at my request by one of my pupils, by placing his feet in cold pump water for a few minutes, the pulse was reduced 24 strokes in a minute, and became so weak as hardly to be perceptible."

Experiments upon the effects of cold water on the pulse, have been also made by Dr. Marcard, first Physician to the Duke of Holstein, with results precisely similar. After it had been applied for about four minutes, he observes that the pulsations were uniformly much diminished, both in force and frequency.†

* Blumenbach's Physiology. Sect. cxi.

† This subject is further pursued in the Appendix, No. II. to which the reader is referred. As the frequency of the pulse is liable to be af-

The debility and inactivity observable in the inhabitants of cold countries, were enumerated in the third place, among the effects of Cold. These effects become evident, in proportion as we advance to the frozen regions which encircle the Pole. All travellers who have penetrated into those inhospitable climes, have given us a corresponding account of the torpid and feebly animated existence of their inhabitants. This debilitating effect has been extended by some writers to the faculties and operations of the mind;† and the inhabitants of the Frigid Zone have been accused by them of stupidity, imbecility, and cowardice.

Fourthly,—Violent degrees of Cold, if long applied, are, as is well known, capable of entirely extinguishing the vital powers. Seven thousand Swedes are said to have perished at once, in attempting to pass the frozen mountains, which form the western barrier between that country

affected by such a variety of causes, I should not consider its diminution, independently of its force or tension, as any proof of its sedative agency; especially as we find this effect produced by many of the most active stimulants: thus, Madeira wine, in a low fever, will diminish the frequency of the pulsations from 130 to 100,—90, or a still lower number; but its fulness will be proportionably increased.

† Ferguson on Civil Society.—Wilson on Climates.

and Norway.* But Cold, when combined with moisture, chills the body much faster than dry Cold of a much lower temperature; for water is a much better conductor of heat than air.† If combined with the moisture produced by the solution of snow or hail, even though it be but a few degrees lower than the freezing point of Fahrenheit, it may prove fatal. The evaporation which takes place gradually carries off the heat of the body, till there no longer remains a sufficient degree of it, for the support of animal life. In such cases, the sufferer feels himself exceedingly chill and uneasy; he gradually becomes unwilling to use exercise, or to keep himself warm, and at last feels drowsy; sits down to refresh himself with sleep, and awakes no more.‡

Fifthly,—The application of Cold to the sur-

* Encyclopædia Britannica, Vol. v.

† “In cold moist days,” says Dr. Darwin, “as we pass along, or the wind blows upon us, a new sheet of cold water is, as it were, perpetually applied to us, and hangs upon our bodies: now as water is 800 times denser than air, and is a much better conductor of heat, we are starved with cold like those who go into a cold bath, both by the great number of particles in contact with the skin, and their greater facility of receiving our heat.”—(*Botanic Garden, Part 1st, Additional Note 12.*)

‡ The drowsiness produced by excessive Cold, seems an universal effect, and was long ago remarked by Boyle, in his Treatise upon the

face of the body, produces accumulated sensibility to the stimulus of heat. Hence the glow upon the skin after immersion from the cold bath, or upon entering an apartment moderately heated, after exposure to a refrigerated atmosphere.† From the accumulated sensibility thus produced, a debilitated frame has experienced renovated energy; and the observation of this effect, has, I believe, been a principal source of

subject.—Under this head he inserts some extracts of a letter, in which we find the following passage. “As to those who are killed with Cold, they perish differently. For some not being sufficiently fortified against the Cold by their own internal heat, nor competently armed against it, by furs, inunctions, and other external means; after having their hands and feet first seized, till they grow past feeling it, the rest of their bodies is so invaded, that they are taken with a drowsiness that gives them an extreme propensity to sleep, which if indulged, they awake no more, but die insensibly.” A more recent instance of this effect of Cold, is furnished by the case of Dr. Solander, which has been already alluded to. He had almost fallen a victim to it; although it is remarkable that he had previously warned his companions of its dangerous consequences, and had conjured them not to give way to its influence. Notwithstanding this caution, he was himself seized with a violent inclination to sleep, and insisted upon sitting down for the purpose of indulging it. The united efforts of his friends, at length roused him from his alarming slumber, and rescued him from destruction.

† This fact did not escape the notice of the great Father of Medicine. “Those,” says he, “who after journeying through snow, or any other great Cold, are very much chilled, either in their feet, or their hands, or their head, suffer greatly at night, when they are covered up warm, with a burning and tingling, and some are even affected with blisters, as if they were burnt by fire.”—*Hippocrates, Edit. Vander Linden. p. 30.*
—Those disagreeable affections of the extremities called Chilblains, owe their origin to the same source.

the belief that Cold has a tonic and stimulant operation. But a satisfactory answer to any objections arising from this source, is, I think, furnished by the ingenious explication of these supposed stimulant effects, given by Dr. Brown, and Dr. Darwin. “If Cold” observes the author of the *Elements of Medicine*, “sometimes appears to stimulate, it produces that effect not as actual Cold; but, either by diminishing excessive heat, and reducing it to its proper stimulating temperature, or, by accumulating the excitability diminished by excessive stimulus, and communicating energy to the stimulus of the exciting powers, now acting too languidly.*

Dr. Darwin’s explanation is, perhaps, still more satisfactory. “From the quiescence” he observes “of such extensive systems of vessels as the glands and capillaries of the skin, and the minute vessels of the lungs, with their various absorbent series of vessels, a great accumulation of sensorial power is occasioned; part of which is again expended in the increased exertion of all these vessels, with an universal glow of heat in consequence of this exertion, and the

* *Elements*, Vol. I.—Sect. xxxvii.

remainder of it adds vigour to both the vital and voluntary exertions of the whole day."

"If the activity of the subcutaneous vessels, and of those with which their actions are associated, was too great before cold immersion, as in the hot days of summer, and by that means the sensorial power was previously diminished, we see the cause why the cold bath gives such present strength, namely, by stopping the unnecessary activity of the subcutaneous vessels, and thus preventing the too great exhaustion of sensorial power."

Indeed, from a review of this part of the subject, it would appear that the same arguments which have been adduced to prove the stimulating agency of Cold, from the effects of the cold bath, in communicating vigour to the system, might, with equal force and propriety, be applied to establish the exciting powers of venæsection. For who has not seen the system recover from an oppressed and languid state, to tone and vigour, by the loss of a few ounces of blood, and thus, (to adopt a phrase from Dr. Sayer's Trea-

tise on Nervous Diseases,) beheld “ a cordial conveyed at the point of a lancet ?”

A writer, however, who is equally distinguished by his advances in Medical Science, and in Polite Literature, has, in a late publication upon the Medical Effects of Cold and Warm Water, declared himself unconvinced by the ingenious theory of the author of *Zoonomia*, and still disposed to admit the stimulant operation of Cold. In support of this idea, he cites the effects of the affusion of cold water on the surface of the body in the torpor of convulsion, and in the apoplectic state induced by the fumes of charcoal. With deference, however, to the sagacity and talents of Dr. Currie, I cannot think that the instances which he has adduced, are by any means satisfactory. As convulsive diseases are frequently accompanied by a sthenic diathesis, cold water may exert in such cases a sedative operation alone, and thus take down morbid excitement. Some facts which give countenance to this opinion, will hereafter be found under the head of *Tetanus*. Its effects would appear more nearly allied to the class of stimulants, when it recalls the suspended vital energies

of a patient, in whom inanition, the operation of sedative passions, or the loss of blood, may have induced syncope. In some of these cases, however, the natural heat of the face and extremities may be so much diminished, that the temperature of common spring water may be, in a slight degree, stimulating. It is certainly in this way that it acts in recalling animation in persons who have been apparently frozen to death. But without resorting to this supposition, it is probable that in contemplating the effects of cold affusion, an important circumstance has been unattended to. Does not the affusion of a bucket of cold water upon the naked body, act from its weight and impetus as a mechanical stimulus, as well as by change of temperature? and would not the sprinkling of a few drops of tepid water, rouse a person in syncope, as rapidly as the same quantity drawn from the coldest spring?

To the asphyxia induced by the fumes of charcoal, Dr. Currie justly applies the epithet "apoplectic." Various experimental writers upon this gas have proved its highly stimulating

nature, and established this analogy ;* and even

* In an interesting Inaugural Essay, published by my friend Dr. Johnson, of South Carolina, both these points are most completely and satisfactorily established, by a variety of experiments ingeniously conceived and diversified. In one of these, he stripped to his shirt and entered a brewer's beer-tub, which had not been cleared of the carbonic acid gas after the liquor had been drawn off. His pulse before he entered was 84,—in five minutes it rose to 88,—in ten to 90. Having then observed by the extinction of a candle, that the atmosphere of carbonic air extended only to his middle, he knelt down, that his body might likewise be invested by it, and in five minutes more his pulse rose to 120. Though the weather was rather cold, and he was naked, he felt a comfortable warmth, except in one hand, which was held up to a medical friend who was examining his pulse.

Upon another occasion, he applied to his eye a stream of this gas issuing from powdered marble, and diluted sulphuric acid mixed in an oil flask ; in a quarter of a minute the irritation was evident, and in one minute and a half, the smarting and pain were so considerable that he could no longer endure it. His eye became greatly inflamed, all the blood-vessels of the Tunica Conjunctiva being distinct and turgid with blood ; the whole surface of the opaque Cornea was covered with blood-vessels.

In a third experiment, he inhaled $\frac{1}{3}$ by measurement of carbonic acid gas, with $\frac{2}{3}$ ds of atmospheric air. His pulse rose in the space of one minute and a half, from 76 to 100 strokes ; his body which was not warm before, now burned with a glow of heat, and his head seemed turgid with blood.

He afterwards made one still more decisive, by descending, as before, into a brewer's tub ; and inhaling the gas immediately from its surface, where in contact with the atmosphere. His pulse immediately increased in fulness, tension, and force, and was found by a friend who noted its state, to beat 100 in the minute, and to become bounding and irregular. His respiration became exceedingly laborious and stertorous ; his body, which before was not warm, now burned with a glow of heat, attended with profuse perspiration ; his temples throbbed ; his neck and head seemed greatly distended and turgid with blood ; and in short his sensations were those of the most excessive plethora. His eyes next seemed violently distended, his sight became dim, and almost totally lost ; and he was withdrawn from his perilous situation at the moment that he appeared to be about to lose all sensation. The intrepid, but unfortunate Pilatre de Rosier, made a similar experiment.

where its stimulating operation appears to have been doubted, the treatment recommended in order to obviate its effects, can, it should seem, be justified, only by admitting it. Dr. Percival, in his *Essay on the Vapours of Charcoal*, supposes that they act on the olfactory nerves first, and that the brain and nervous system are affected by sympathy or consent of parts; and although he does not expressly assert that these effects on the nervous system are produced by a sedative power, he remarks that, "they occasion, sometimes, all the various symptoms of a debilitated nervous system, according as the poison is more or less concentrated." He, however, afterwards, recommends the application of the remedies usually administered to take down inflammatory action, as bleeding, cupping, blistering, cold air, cold water, and the like. Now the affusion of cold water has been recommended by many practical writers in the sanguineous apoplexy; but, I apprehend, not with a view to its stimulant operation in a disease in which stimuli are generally considered to be strongly contraindicated, and carefully abstained from. If, in such a case, it appear to excite the motions of the arterial system, and

rouse the patient to a consciousness of existence, its effects are parallel, as has been already hinted, to those of the lancet in similar cases of oppressed or suffocated action.

But it may be further observed, that water absorbs, as is well known, many times its volume of this gas, and will purify an atmosphere that is rendered highly noxious by an admixture with it. And it is possible that Mr. Keir, in his *Chemical Dictionary*, has given the real explication of the only mode in which it acts as a stimulus, if in reality it ever have that effect, by supposing that it is decomposed; that its oxygen penetrates the pores, or is absorbed, and stimulates the heart immediately into action. These considerations prevent me from admitting the validity of the conclusion drawn by Dr. Currie.

The Doctor, however, admits that "Cold, in an extreme degree, is a powerful and effectual sedative;" but, he observes that "its stimulating action, though short in duration, is powerful in degree."* Although I am disposed to believe that many remedies have been called sedatives,

* Currie, on Cold and Warm Water, 2d Edition, page 73—74.

which ought rather to have been referred to the head of the class of stimulants; and although, perhaps, an attentive observer might detect a period, in which almost every article assigned to the former division exerted a stimulating effect, I cannot assent to this position. It is not difficult, for instance, to trace the stimulating effect of opium, a substance which has been generally classed amongst sedative remedies, especially, if it be given in small and frequent doses. The arterial, the nervous, and perhaps every other system of the body feels its influence. But in what stage of the operation of Cold can we trace an analogous period of stimulation? If any such period existed, why should its effects be so injurious, as they appear to be in the cases detailed by Dr. Currie himself, whenever there was a deficiency of febrile heat upon the surface? It would seem that the application of cold water, by affusion, is so transient and momentary, that its stimulating agency must be secured, and its debilitating influence completely obviated. But the result is found to be widely different. The powers of the system are prostrated below the point of reaction; and warm applications with friction, and even cordials, are found necessary to prevent its injurious consequences.

CHAP. II.

REMARKS UPON THE HISTORY OF THE MEDICAL APPLICATION OF COLD, AND ITS EFFECTS.

ALTHOUGH the use of Cold as a remedy, in certain diseases, has the sanction of remote antiquity, it has had to struggle with much opposition. The writings of Hippocrates, of Celsus, and of Galen, might be cited in support of the former position; the experience, even of the present day, may unfortunately be adduced to establish the latter. Although a more rational mode of practice prevails at present almost universally, the period is comparatively recent, when the admission of atmospheric air was cruelly denied in fevers, even in warm weather.*

* "It is only a late practice" says Dr. Moore, "in this island, to indulge the patient in breathing a cool air, and in being freed from an oppressive load of bed-cloaths. Yet this is so obvious and so natural a way of giving relief to those who suffer from heat, that nothing could have prevented its being universally adopted, but some deeply rooted prejudice, or erroneous theory respecting the nature of fever, and the necessity of forcing sweats."—*Medical Sketches*, p. 359.

This is the more singular, as there were not wanting authorities strongly in favour of cold applications among some of the early writers of the eighteenth century.* But these authorities appear to have been either forgotten or disregarded; and although the sick are no longer oppressed by being compelled to respire the vitiated air of a confined apartment, the more extensive application of reduced temperature has been recommended by authors of a modern date, with much doubt and hesitation.—Dr. Cullen appears, at times, to have entertained considerable doubts with regard to the beneficial effects of Cold. These doubts probably arose from the contradictory qualities which he had assigned to it. After mentioning some cases, in which much advantage has been said to follow its use, he thus expresses himself. “What is the mode of its operation, to what circumstances it is particularly adapted, or what limitation it requires,

* See particularly the remarks of Sir John Floyer, and Dr. Baynard, in their *Treatise upon Hot and Cold Baths*. The cases which they record, are related in a singularly quaint style, and are rendered the less valuable, as in many instances no account is given of the temperature of the system, at the time of the administration of the remedy. They shew, however, what has been effected by a practice apparently empirical, and excite just expectations of the most favorable results from similar applications, if regulated by the rational principles, and judicious cautions, laid down by Dr. Currie.

I shall not venture to determine till more particularly instructed by further experience.”*

In another part of the same work, however, he expresses himself with more confidence, and declares that cold water taken into the stomach, may prove an useful tonic in fevers.† The explanation of the mode in which Cold is, in these cases, erroneously imagined to exert a tonic power, has already been given in the words of Dr. Brown and Dr. Darwin.

Mr. Aitken, of Edinburgh, in his *Elementary Treatise upon Medicine*, proposes some very rational ideas upon this subject. “The application of water of low temperature” he observes, “to the cutaneous surface of the body, or the use of the cold bath as a refrigerant remedy during fever, might be justified upon the same principle as that of other cold applications, with a view to produce the like effects.”‡

I might add here the remarks of an ingenious writer, who, though not professional, has ad-

* First Lines, Sect. cxxxiii.

† Ibid, Sect. ccvi.

‡ Aitken's Elements, Vol. I. p. 394.

vanced similar opinions, and cites a respectable authority in support of them. "I am persuaded" says Brydone, "that in skilful hands, few remedies would be more effectual in many of our stomach and inflammatory complaints, than a free use of iced liquors; as hardly any thing has a stronger and more immediate effect upon the frame; and surely our administering of warm drinks and potions in these complaints, tends often to nourish the disease. It is the common practice in Sicily to give quantities of ice-water to drink in inflammatory fevers; nay, so far have they carried it, that Dr. Sanghes, a celebrated Sicilian physician, covered the breast and belly of his patients with snow or ice; and they assure us, in many cases, with great success."*

It might be at once curious and amusing to trace the gradual progress of similar opinions, from the earliest period in the history of medicine; but the inquiry would, if pursued, extend this chapter to too great a length. It is the less necessary, as an elegant Historical Sketch of the early use of cold affusion, has already

* Tour through Sicily and Malta, Vol. II.

been given in the Medical and Physical Journal.* But many, who have advanced opinions favourable to such doctrines in theory, have afterwards exprest so much timidity with respect to their practical application, that their suffrage has been of little avail. From this charge, however, some few writers must be exempted. The ravages of the Yellow Fever in the western world, rendered it necessary for the practitioners of the United States, and the West India Islands, to furnish themselves with every weapon which afforded a chance of disarming the violence of so formidable an enemy. Cold applications of various kinds, appeared to be among the most obvious means of relieving a symptom which had been supposed by some authors, sufficiently pathognomonic to give a name to the disease.† The burning heat of the skin, which was in many instances, so distressing to the patient, and so alarming to the practitioner, soon gave way to this simple remedy, when administered in a degree proportioned to its violence, both in form and duration. In our own country, the enlightened au-

* Vol. IV.

† It is called by Moseley, the Endemial CAUSUS.

thor of *Zoonomia*, appears more fully aware than almost any systematic writer of its extensive use ;* and I shall frequently avail myself of a reference to his authority in the subsequent parts of this Essay. Another sagacious physician has given us a variety of facts which establish the importance of cold affusion in typhus fever, and has laid down a system, calculated in all cases, not only to obviate any risque from its use, but to insure its beneficial application. To Dr. Currie's Treatise nothing can be added upon the subject of this disease ; but, from a perusal of the following pages, it will, I hope, appear, that the remedy there so scientifically recommended, may be applied in a variety of other diseases, and in many of them to a far greater extent, than in any instance which he has recorded.

If what has been observed with respect to the operation of Cold in the preceding chapter, be admitted as just, we should naturally be led to infer, that its beneficial effects must be particularly evident in diseases of great inflammatory action. Agreeably to this opinion, we

* See his *Theory of Fever*,—*Zoon.* Vol. II.—p. p. 549—574—590.

shall find that the use of it may be proportioned in extent, to the degree of this action present in the system.

It may be applied as a remedy, under three forms, air, water, and ice or snow. The admission of cool air to the surface of the body, is often equally grateful and beneficial to the sick,* but its effects are far inferior to those produced by cold water. Moreover, in certain countries and seasons, it might be often difficult, or even impossible, to obtain the former; but the latter may always be procured, and even if its temperature be comparatively warm, in consequence of its superior powers as a conductor of heat, its effects in cooling the skin would be rapid and certain. The refrigerating effects produced upon the system by moderate degrees of cold, when combined with moisture, have already been hinted at; and these effects become particularly evident, if the body be at the same time exposed to a current of air. The

* Two physicians to the army, Dr. Sinnot, and Dr. Sutton, have attested, that during the rapid retreat of the British troops from the banks of the Waal to Embden, in the dreadful winter of 1793, and 1794, the fever patients, though carried in open waggons, universally recovered. (*See Beddoes's Hygieia,*) Vol. II. p. 49.

evaporation which takes place, carries off the heat of the body with such rapidity, that it is difficult to counteract its influence. The refrigerating effect of evaporation is known to every one who is conversant with the first principles of chemistry; and where the urgency of the symptoms demanded it, the process might be easily imitated by ventilation. The affusion of water, or sponging the patient with vinegar or water, should come next to exposure to cold air, in the class of refrigerant applications. In many cases of fever, this transient exhibition of the remedy in question, would be found amply sufficient.* But when a high degree of in-

* While the preceding pages were printing off, the first number of the Edinburgh Medical and Physical Journal, came into my hands. In that part of it appropriated to the examination of Medical Works, Dr. Currie's Reports are reviewed, and meet with a justly merited eulogium. In delivering their own sentiments upon the subject, the Reviewers observe, that affusion in the early stage of fever, seems to produce its salutary effects like a charm, and at this period they attribute to it a specific effect, far superior to that produced by sponging the body. But after the disease has continued for two or three days, they appear to consider the choice of either application as indifferent. I can easily conceive that the shock produced by cold affusion, may, in a moderate attack of fever, at once dis sever the febrile catenation; and thus the difference between the effects of the two processes, may be accounted for. As soon as the system becomes habituated to its influence, the shock is no longer perceived, and a diminution of the excess of heat, is the only salutary effect which it produces. But if this be the object in view, is not its attainment more effectually secured by cold ablution? a process which may be repeated or continued at pleasure, with the least possible disturbance of the patient, and without any sudden agitation of the system?

flammatory action exists, or when the heat of the climate or season are considerable, the advantages of mere affusion might, probably, appear ambiguous, from the reaction of the system, and the accumulated sensibility to the stimulus of heat which would follow its use. Dr. Brown remarks, that “heat is always hurtful in sthenic diseases, but still more so after a previous application of cold.* In a particular manner, after the application of cold in an intense degree, must the application of heat be avoided, because its operation, from the increase of the excitability by cold, becomes more effective.”†

* Elements of Medicine, Vol. I. p. 289.—Vol. II. p. 2.

† The danger of this practice is particularly evident in the fatal consequences produced by the use of warm applications to frozen limbs. Tissot observes, that “if heat be applied to a frozen part, the case proves irrecoverable. Intolerable pains are the consequence, which pains are speedily attended with an incurable gangrene, and there is no means left to save the patient’s life, but by cutting off the gangrened limbs.” (*Avis au Peuple*).—Of this he gives us a melancholy instance, in the case of an inhabitant of Cossonay, who had both his hands frozen. Some warm liniments were applied to them, the consequence of which was the necessity of cutting off six of his fingers.

To avoid these fatal consequences, the part affected should be immersed in cold spring-water, it may even be necessary to render it colder, by putting in a little snow or ice. This moderate increase of temperature will be sufficiently stimulating to a limb which has been long exposed to an intense degree of cold; and as life and motion gradually return, greater degrees of comparative heat may be applied, till it regain its former temperature.

“Cold is the beneficial degree of temperature in the cure of this (*the inflammatory*) diathesis, but it must be cold not followed by any considerable degree of heat. That mistake, therefore, in medical practice, of thinking cold hurtful in sthenic diathesis by a stimulant operation, should be corrected ; and its benefit in the small-pox is not to be understood to arrive so much from its mere debilitating degree, as from avoiding the stimulus of heat after its operation.”—In such cases, therefore, it should seem that whatever benefits may have been derived from the temporary use of cold applications, much greater and more permanent advantages have followed their exhibition for a longer period of time, or in a more concentrated form, as that of snow or ice. In some diseases, there may exist degrees of inflammatory action so violent, as to require the combined operation of all these forms ; as there may exist others so moderate, as to render the use of one only, necessary. Nay, the same disease, which, at its first onset, required refrigerants of the most powerful kind, may be so far reduced in its progress, as to yield at last to the cool air ; which, as is observed by Dr. Beddoes, “might

probably answer in those advanced stages of fever, where affusion with water might be unsafe or ineffectual.”*

In tracing the beneficial effects of Cold in various diseases, I shall, with a view to the more commodious distribution of the subject, pursue as nearly as possible, the nosological arrangement of Dr. Cullen ; as, notwithstanding the defects which it possesses, in common with all other Systems of Nosology, and those peculiar to itself, from the prejudices of its celebrated author, it is the one, in this country, most generally adopted. In the following chapter, therefore, I shall proceed to lay before the reader, the salutary effects of this remedy, in those diseases which he has classed under the head of *Febres*.

* Hygieia, Vol. II. p. 52.

CHAP. III.

OF THE USE OF COLD APPLICATIONS IN
SEVERAL GENERA OF THE FEBRES OF
DR. CULLEN.

SECTION I.

OF THEIR USE IN INTERMITTENT FEVER.

THE first genus which we meet with, in pursuing our investigation, is the intermittent fever. This disease has been assumed by Dr. Cullen, as the most convenient example of a simple febrile paroxysm ; and it will be found that the rules necessary to direct our application of the remedy which is the subject of these pages, may all be conveniently exemplified in the treatment of this malady. It has a stage where the vital action is deficient in force ; another where it is excessive ; and a third, where it gradually approaches more or less to the natural and healthy state. Agreeably to the laws of

the operation of Cold already laid down, we shall find that its use is strongly contraindicated in the first, and scarcely less so in the last of these stages ; but that in the intermediate one, it may exert a highly beneficial agency. This confirms the supposition of its sedative power, and establishes the improbability of its exerting any tonic or stimulating quality. The most approved and concise rule that can be laid down in the paroxysm of an intermittent, is that given by Dr. Darwin, in his Section on *Febris Irritativa*, viz. to warm the patient in the cold fit, and cool him in the hot one ; or, in other words, constantly to bring the state which is present, to as rapid a termination as possible.* Now if Cold, according to the supposition of Dr. Cullen, “ removed the causes, and obviated the effects of debility, by supporting and increasing the action of the heart and arteries,” it is obvious, that the phenomena of the cold stage of an intermittent, would strongly indicate its application. But, experience would soon convince us of the erroneous theory here laid down, if we ventured under such circum-

* *Zoonomia*, Vol. II. Class I. 1. 1.—Wilson on Febrile Diseases, Vol. I. p. 184.—Currie on Cold and Warm Water, p. 180.

stances to apply the remedy.* If, however, we defer it till the hot stage be fully formed, we shall find that we have it in our power to abridge the sufferings of the patient in a considerable degree, by exciting a diaphoresis, and thus inducing the natural crisis of the paroxysm, in a much shorter time, than can be effected by any other means. If after the sweat begin to flow, we should continue either to expose the patient to a reduced temperature, or to ply him with cold drink, we should be again admonished of our error, by the unfavorable symptoms which would succeed this plan of treatment.

The absurd and injudicious custom of forcing sweats, by covering the patient with a load of bed-cloaths, has been, for some time, combated by judicious writers, and abandoned by intelligent practitioners. Prejudices, however,

* In the 37th page of Dr. Currie's work, a case is related, in which the affusion was applied to a patient under these circumstances, in consequence of the protraction of the chilly fit beyond the usual period. The effects shall be given in the Doctor's own words. "His breathing was almost suspended, his pulse at the wrist was not to be felt, the pulsations of the heart were feeble and fluttering, a deadly coldness spread over the surface; and when respiration returned, it was short, irregular, and laborious." These alarming symptoms gave way to the treatment alluded to in the conclusion of the first chapter of this work.

still exist in the minds of patients, and their friends ; and it were to be wished that the theory of perspiration were more generally understood, in order that they might be effectually obviated. Perhaps no author has laid down the laws of the phenomenon of perspiration, with greater precision than Dr. Darwin. I shall therefore beg leave to transcribe, in this place, a part of his section on *Sudor Calidus*.

“ The perspirable matter,” he observes, “ is secreted in as great quantity during the hot fit of fever, as towards the end of it, when the sweat is seen upon the skin. But during the hot fit, the cutaneous absorbents act also with increased energy, and the exhalation is likewise increased by the greater heat of the skin ; and hence it does not appear in drops upon the surface, but is in part reabsorbed, and in part dissipated in the atmosphere. But, as the mouths of the cutaneous absorbents are exposed to the cool air or bed-cloaths ; whilst those of the capillary glands, which secrete the perspirable matter, are exposed to the warmth of the circulating blood ; the former, as soon as the fever fit begins to decline, lose their increased ac-

tion first ; and hence the absorption of the sweat is diminished, whilst the increased secretion of it continues for some hours afterwards, which occasions it to stand in drops upon the skin. “ As the skin becomes cooler, the evaporation of the perspirable matter becomes less, as well as the absorption of it. And hence the dissipation of aqueous fluid from the body, and the consequent thirst, are perhaps greater during the hot fit, than during the subsequent sweat. *For the sweats do not occur, according to Dr. Alexander’s experiments, till the skin is cooled from 112 to 108 degrees of heat ; that is, till the paroxysm begins to decline.*”

The application of this doctrine, is highly important ; for, as fevers terminate, in general, with some degree of moisture upon the surface ; and as it was observed that an increase of the external warmth, was, under some circumstances, a means of inducing this phenomenon ; the patient, although already suffering from an excess of temperature, was still further oppressed by a load of bed-cloaths, with a view to hasten, as was supposed, this salutary operation of nature. But, by such a mistaken practice, the

paroxysm was necessarily prolonged ; for, as we have already seen, the moisture upon the skin is owing to the cutaneous capillaries losing their increased action, from the contact of the cool air or bed-cloaths, before that of the internal secerning vessels has subsided. By increasing the quantity of covering, this effect is prevented ; their action is powerfully increased, and the more so, because, as they are habituated in some instances to the contact of the external air, and in all, to a temperature much inferior to the internal heat of the body, their excitability to the stimulus of heat is proportionably greater. The inconvenience and sufferings sustained by the patient, are often, in such cases, still further aggravated by the exclusion of fresh air from his apartment, in consequence of which, he is compelled to respire a contaminated atmosphere. There are doubtless, many fevers, (the ardent fever of the West-Indies would, I believe, furnish an example) in which the powers of life would be extinguished by an adherence to this plan, before the paroxysm would so far subside, and the action on the surface be so far diminished, as to permit the condensation of the perspired fluid.

From a consideration of these facts it would appear, that diminished temperature would be the most effectual means of inducing perspiration in any febrile paroxysm, where the heat much exceeded the natural standard. The hot fit would be materially shortened, and the expenditure of sensorial power would be consequently diminished. Nor is the application of Cold, with this view, a novelty. In Italy, large quantities of cold water are given in fevers, after the manner of the ancients, with a view to procure vomiting and sweating. This is also said to be a part of the practice of the Spanish physicians, and is called the *Diæta Aquea*.*

In his chapter on Diaphoretics, Dr. Cullen observes, that in making up his catalogue, he had thought of inserting *Aqua Frigida*.—"Taken into the stomach" he remarks, "that it is a powerful means of exciting the action of the extreme vessels, and with the assistance of covering the body very closely, it may be employed for exciting sweat." In a subsequent paragraph he gives an account of the antiquity

* Moseley on Tropical Diseases, p. 441.—Cullen's First Lines, Sect. clvii.

of this practice, but declines giving a decided opinion either with respect to its effects or its propriety. Upon the powerful agency, however, of reduced temperature, in producing diaphoresis, the evidence afforded by Dr. Currie's admirable Treatise is so full and satisfactory, that I conceive it unnecessary to insist upon it further in this place, but shall beg leave to refer the reader to the almost uniform effect of every instance of cold affusion there enumerated, when the heat of the surface exceeded the limits of healthy action. A more permanent application of the same remedy, has been resorted to with equal success by Dr. Wright. When the most urgent symptoms of fever had been subdued, he ventured to wrap the patient up in a wet blanket. A profuse sweat was induced, and an immediate recovery was the consequence.*

It is scarcely necessary to remark that the disease under consideration will not require the administration of Cold to an equal extent with many others which will be treated of in the following pages. Little more would, in general,

* Annals of Medicine, Vol. II.

be required, than to gratify the desire of the patient for cool liquids, and to remove the bed-cloaths as soon as the hot stage was fully formed. The use of the thermometer, as recommended by Dr. Currie, might assist in deciding upon the period of the paroxysm, when this practice might, with propriety, be adopted. It has already been remarked, that Dr. Alexander found that sweat did not flow till the body was cooled down to 108 degrees; he also found, that when the heat was above that point, nothing produced sweats but repeated draughts of cold water. He adds, that this treatment as certainly stopt perspiration, when the heat was below that degree.* That the adoption of the above plan, would almost uniformly abridge the duration of the hot fit, and put an end to the distressing feelings of the patient, I am convinced from personal observation. In a patient with a strong constitution and sanguine temperament, who had been subject to violent and repeated attacks of Tertian for some years, the hot stage of which had been, uniformly, of considerable duration, and was always attended with delirium, the removal of the bed-cloaths

* Zoonomia, Vol. II. p. 698.

in a cool day in August, put a stop to the hot fit in a few minutes, and he felt a degree of vigour during the apyrexia, to which he had before, in general, been a stranger. Emboldened by the relief which he had experienced, he rose from his bed, without advice, in the succeeding paroxysm, which was terminated with equal rapidity, and was succeeded by an unusually long respite from any attack of the disease. In another instance, the same patient had five successive attacks, which had resisted a very extensive use of bark, wine, and other tonic and stimulating remedies. The apyrexia was daily becoming less and less distinct. The sixth paroxysm was an anticipating one; and began at midnight, nearly twelve hours before the usual time of accession. A severe chill was succeeded by violent heat and pain in the head, accompanied by incipient delirium. Recollecting the relief which he had formerly experienced from exposure to cool air, and pursuing the analogy, he rose from his bed, drank a glass of cold water, and brought a bason filled with the same fluid to his bedside, and dipping the end of a napkin into it, repeatedly bathed his temples and forehead. The great refreshment de-

rived from this application induced him to wet the napkin entirely, and bind it round his head. In this situation he fell asleep, and awoke the next morning with the napkin still round his head, but long since perfectly dried, and more free from any unpleasant sensation of his disorder than he had been for a fortnight preceding. He omitted the use of the bark and of all other remedies, and had no other paroxysm; nor had he any return of his disease for upwards of two years, at the expiration of which period he removed to a more healthy situation. It is possible that the unusually long intervals between the attacks, might not have been owing to the abovementioned treatment; but the circumstances detailed, prove the safety of the remedy. In the latter instance, in particular, an anticipating paroxysm, might furnish a rational ground of apprehension, that the disease was about to change its type, or to acquire additional severity.* But these apprehensions were happily without foundation.

Dr. Currie has recorded a highly satisfactory case of an intermittent, which had resisted all

* Wilson on Febrile Diseases, Vol. I.

the common modes of treatment, during a period exceeding three months. It was suspended by the affusion of cold brine two hours before the expected paroxysm, and finally removed by a similar application after the hot stage was completely formed. The symptoms were instantly abated, and gentle perspiration, with profound sleep, succeeded.

SECTION II.

OF THE USE OF COLD IN SYNOCHA.

ALMOST every disease which exhibits the phenomena of synocha, combines with it, more or less obviously, the symptoms of topical affection. It then changes its appellation, and receives that assigned to inflammation of the viscus, supposed to be particularly affected, as Phrenitis, Pleuritis, Gastritis, and the like: on each of which a few remarks will hereafter be offered, under their proper heads. Hence it has been remarked by practical writers, that a disease exactly agreeing with the nosological description of Synocha, is an exceedingly rare

occurrence. For this reason, I shall not detain the reader by enlarging upon this division of fever. It may be sufficient to observe, that cold applications may naturally be supposed to exert a salutary agency in a disease, of which increased heat is one of the most prominent symptoms.* Diminished temperature is recommended by all practical writers; and by some the free use of Cold is inculcated; particularly by the enlightened author of *Zoonomia*.†

SECTION III.

OF THE USE OF COLD IN TYPHUS.

IT would be easy to fill many pages with the detail of cold applications in Typhus Fever. They have for many years been freely and successfully employed. Amongst their earliest advocates we find the name of Dr. Gregory, Professor of the Practice of Physic in the College of Edinburgh. His method is to

* “*Calor plurimum auctus.*” *Cullen’s Nosology*.

† See *Zoonomia*, Vol. I.—Sect. xii, 6, 2. xxxii. 3. 3. Vol. II, p. 608.

order the patient to be washed once or twice a day, with a sponge dipt in cold water or vinegar. This practice was employed by him with remarkable and striking efficacy, in the case of a fellow-student, who lodged in the same house with the author, during his residence in that university. But although the salutary effects of this remedy could not but impress the mind of every person who witnessed them, rules were still wanting, to determine with precision, in what cases, and under what circumstances, it could be applied with uniform safety and advantage. This deficiency, however, exists no longer. Dr. Currie, in his Medical Reports on the Effects of Cold Water, has reduced to a system the scattered facts with respect to its application in this disease; and laid down a rule which would render it uniformly certain and efficacious, in that variety of it which he describes; and, perhaps, in all other febrile diseases. His grand precept is that it should be exhibited only when there is no sense of chilliness present,* when the heat of the surface is steadily

* In the last Edition of his work, he inserts some remarks of a correspondent at Norwich, which prove that this precept admits of some limitations.

above what is natural, and when there is no general or profuse perspiration. These principles he illustrates by a great variety of important and instructive cases ; but it can scarcely be necessary to make further extracts from a work which is in the hands of every member of the Medical Profession, and which is written in a style at once so clear, eloquent, and intelligible, that its perusal is rendered interesting, even to the unprofessional reader.

A practice founded upon similar principles, though by no means laid down with equal precision, seems to have been suggested by experience to a Medical Practitioner in the United States. In giving the history of a very malignant Typhus fever which prevailed in some of the inland parts of New Hampshire, in the year 1798, the reporter observes, that “ the most dependence was placed upon the cold bath when the hot fit was on. This infallibly gave instant and astonishing relief, rendering the paroxysms shorter and milder. It was applied either generally or locally, as the urgency of the case required : this was determined by the surface that appeared unusually hot.

When the heat was partial or local, a corresponding bath was used."

"The cold bath was generally applied, by laying the patient naked upon a thick blanket, then sprinkling him and the blanket with the coldest water: the wetted blanket was wrapt around him, and suffered to remain till it became warm; when it was thrown off, and sprinkled a second time; thus reducing the heat of the body to the standard of health. *The cold bath served only till the crisis of the fever*; afterwards it was as distressing and painful, as heretofore it was invigorating and pleasant. Many patients have been injured by a continuation of the bath after the crisis."

"When my fever formed a crisis, I did not know, but the cold bath would be as useful as heretofore. When the hot fit came on, I ordered the nurse to prepare the blanket and sprinkle me: *the fit had proceeded to some length before we were in readiness*: the first dash of water seemed to freeze every drop of blood in my veins, and chilled my bones to the very marrow. Never did I perceive so great a

change in twenty-four hours, from the pleasing and animating, to the painful and distressing.”*

What this crisis was, the author has not been sufficiently explicit in describing. He observes, however, in another part of his narrative, that it was “very evident;” and most probably it was marked by a general perspiration. This will sufficiently account for the change in the effects produced by the remedy, and in the sensations of the patient. It is further probable, in his own case, that the heat of the paroxysm had considerably declined, previously to its administration, in consequence of the delay to which he alludes.

But there is a Fever improperly classed in the nosology of Dr. Cullen as a variety of Typhus, in which cold has been employed by modern medical practitioners, to an extent scarcely contemplated even in idea by their predecessors. This is the Typhus Icterodes, or Yellow-Fever.† A brief view of the beneficial

* See N. York Medical Repository, Vol. III. p. 5.

† It would be difficult for the most ardent admirer of nosological arrangement, to vindicate the propriety of the station first assigned to

consequences resulting from this practice, may be useful and acceptable to any member of the profession, who may be called upon by duty or inclination to encounter the formidable diseases of a tropical climate.

Amidst the various and contradictory opinions entertained by different practitioners, with regard to the origin and treatment of the Yellow Fever, which desolated the city of Philadelphia in the year 1793, it may be observed, that all agreed in recommending the use of cold water and cool air. Their efficacy was proved in a remarkable manner, by the sudden check given

the Yellow-Fever, by Sauvages, and afterwards adopted by Dr. Cullen. By some of the most acute observers of this disease, its contagious nature is denied; by all it is confessed to be very limited. The heat in it is frequently so urgent and distressing, that Dr. Moseley has given it the name of *Causus*, or ardent fever. (*Tropical Diseases*, p. 390 and seq.) The arterial action is often violent. This is particularly observable in the throbbing of the carotid and temporal arteries, and in the quickness, and tension of the pulse. Let the reader compare the symptoms of this disease, as given by practical writers in general, with those laid down as characteristic of Typhus. Will he not be surprised to find this scourge of the western world classed as a variety of a disease—which is contagious, with little increase of heat, and with a small, weak, and frequent pulse? “*Calor parùm auctus, pulsus parvus, debilis, plerumque frequens.*” For some admirable remarks upon the serious practical consequences resulting from the imaginary distinctions created by nosological arrangement, the reader is referred to the 4th vol. of Dr. Rush’s *Medical Inquiries and Observations*.

to the ravages of the disease by cold weather and heavy rains. The author of a letter published by Dr. Rush, in his account of this fever,* observes, that “he places the greatest dependence, for the cure of the disease, on throwing cold water twice a day over the naked body. The patient is to be placed in a large empty tub, and two buckets full of water, of the temperature of about 75 or 80 degrees of Fahrenheit’s thermometer, according to the state of the atmosphere, are to be thrown over him. He is then to be wiped dry and put to bed. It is commonly followed by an easy perspiration, and is always attended with great refreshment to the patient. This remedy, however, must be applied from the earliest attack of the disease, and continued regularly through the whole course of it.”

In the postscript to this letter the author remarks, that “the practice of applying the cold bath in fevers is not new. In a malignant fever which prevailed at Breslaw in Silesia, and proved extremely fatal, yielding to none of the usual

* Dr. Kuhn, at that period Professor of the Practice of Medicine, in the University of Pennsylvania.

remedies, Dr. De Haehn, a physician of the place, had recourse to this remedy, and found it effectual. It has also been used with advantage in England in putrid fevers. In many of the West-India islands it is generally used in their malignant fevers. Dr. Stevens,* a gentleman of high character in his profession, who is now in this city, assures me that in the island of St. Croix, where he has practised medicine for many years, it has been found more effectual than any method heretofore practised."

The application of Cold, however, in the transitory form which has been above described, would appear rather an ambiguous remedy, in a disease of a nature so highly inflammatory, and in a climate where the heat is so considerable, for the reasons already detailed in the second chapter. Dr. Currie has some valuable remarks upon this subject, which confirm this opinion.† It will afford him pleasure to

* The author of the ingenious Inaugural Essay "*De Alimentorum Concoctione*," Edinburgi, 1777.

† See Note on Inflammatory Fevers, p. 218.—Since writing the above his second volume has appeared, and fully illustrates the propriety of this observation. He observes that the violence of the reaction in *Scarlatina*, is so great, that it is often necessary to repeat the affusion every two hours.

see that the application of cold in the inflammatory fevers of America, has been long since conformed to a theory similar to that which he has laid down.

Dr. Wistar, in a letter containing the history of an attack of the disease, which he had himself encountered, gives a strong testimony from his own experience of the efficacy of cool air, in abating the excessive action of the arterial system.*

Dr. Rush pursued the use of these remedies to a much greater extent. "Cold water," says he, "was a most agreeable and powerful remedy in this disorder. I directed it to be applied by means of napkins to the head, and to be injected into the bowels by way of clyster. It gave the same ease to both, when in pain, that opium gives in pain from other causes. I likewise advised the washing of the face and hands, and sometimes the feet, with cold water, and always with advantage."†

The use of cold water applied by means of

* Rush on the Yellow Fever, p. p. 209—235.

† Rush on Yellow Fever, p. 287.

napkins to the head, is not unknown to those who indulge in an intemperate use of wine, as after an evening of excess it is frequently made use of by them, in order to prevent the fever, which would otherwise be the consequence of the debauch, the next morning.

In the yellow fever of 1794, Dr. Rush used the same remedies, with effects equally happy, and pursued them to equal, if not greater extent. To relieve violent pain in the bowels, he applied cloths dipt in cold water to the lower part of the belly. He applied them also for three successive days and nights, to the head of one of his female patients, in an inflammation of the brain, which succeeded her fever. During this period, they were changed for the greater part of the time every ten or fifteen minutes. In 1795, he encreased the coldness of pump-water by dissolving ice in it, and in some cases applied powdered ice in a bladder to the head, with great advantage.*

He did not conceive it necessary to wash the whole of the body with cold water; but he

* *Inquiries*, vol. IV. p. 91.

found that local applications to the parts particularly affected with pain, as the stomach and bowels, or to the head, when the disease had a determination thither, were in general sufficient.

There are various modes of using ice; the most convenient appears to be that already mentioned, as when inclosed in a bladder, it may be put into the bed with the patient, and applied to any part where it is necessary.

The reader will meet with further authorities in support of this plan of treatment, in the first Volume of the New-York Medical Repository, and the Medical and Physical Journal. In the latter, two cases are recorded, of which, one was treated by affusion of cold pump and sea water, and the other by sponging the body with vinegar, rendered cold by cakes of ice. In one instance, the body of the patient submitted to the plan first mentioned, was not wiped after the application, but he was returned to his mattress wet, in consequence of an idea entertained by his medical attendant, that the water evaporated too quickly.

Bruce informs us in his travels, that the inhabitants of Massuah, cure the malignant tertian fevers, attended with yellowness of skin, to which they are subject, by keeping the patient as it were, in a perpetual bath of cold water. "If the patient" he observes, "survives till the fifth day, he very often recovers by drinking water only, and throwing a quantity of cold water upon him, even in his bed, where he is permitted to lie without attempting to make him dry, or change his bed, till another deluge adds to the first."*

On the internal use of cold liquors in this disease, Dr. Moseley observes,† that Galen cured all his patients, after the first stage of it, with cold water; and goes so far as to say, he never lost one, where cold water was given in a proper manner.

He appears, however, to be dubious himself, with regard to administering cold water internally. He asserts that "cold water is improper in the beginning of the disease, and it is too

* Bruce's Travels, Vol. III. p. 33.

† Tropical Diseases, p. 440.

rapid in its termination, to admit of any delay, or interval, that is not filled up with medicine. Nor can it be given at the same time that the patient is under the operation of cathartics." The experiments of Dr. Rush would seem to authorize a contrary conclusion. He was not deterred from this practice, even when the patient was under the operation of those of a mercurial kind; although the external application of cold water and ice has appeared to many in the highest degree dangerous, whilst the patient was using any preparation of this active mineral. It may, however, be remarked, that one principal ground of objection to this practice is, that it determines the mercury to exert its peculiar and specific action upon the salivary glands. That this effect is produced by Cold, is denied by John Hunter; nor, indeed, does he suppose that any injurious consequences follow exposure to Cold, whilst a patient is taking mercury in any form.* A similar testimony is given by Drs. Selden and Whitehead, in their account of the yellow-fever of 1801, at Norfolk, in Virginia. They observe that "no disagreeable effect was produced by combining

* Vide his Treatise on Lues, p. p. 339—349.

the use of calomel with the affusion of cold water; nor, in a single instance, did the mercury occasion salivation, although the discharge from the bowels was scarcely as great as when it was used alone in the disease. But in almost every instance which terminated favorably, when the cure was trusted to calomel alone, *without the cold bath*, some degree of salivation came on.* But admitting that cold applications have a tendency to produce this

* Medical and Physical Journal, Vol. X. p. 272. This, however, does not correspond with the experience of practitioners in general, in the pestilential fevers of America. If the use of cold applications have not appeared to accelerate, neither has it, in general, seemed to retard the specific action of mercury. The following is an abstract of a case which fell under the care of the author, in the neighbourhood of Philadelphia, in the latter end of the autumn of 1799; in which the cure was principally trusted to the exhibition of mercury, and in which its effects soon became evident, notwithstanding the free use of reduced temperature. The patient had imprudently gone into a part of the city, where the fever raged with great violence, to attend a funeral, and was attacked on the 5th day afterwards. He was first visited early in the morning succeeding his seizure, and was found labouring under great prostration of strength—with a dull head-ach, considerable stupor, and watery eyes; symptoms which are mentioned by practical writers as indicating great malignity in the attack. After a moderate bleeding, a cathartic was administered, consisting of twelve grains of jalap and six of calomel; and, in four or five hours afterwards, three grains more of calomel were given, and a similar dose was repeated every hour, till eleven in the evening of that day, and from eight in the morning till eleven in the evening of two succeeding ones. During this period the windows were left open night and day, although the weather was cold and rainy; and cold water was frequently applied, by means of wet napkins, to the head. On the morning of the fifth day, his gums became sore, and his recovery was rapid and complete.

effect, it should be remembered that an affection of this kind is, in the disease under consideration, the anchor of hope. It was almost universally observed by the practitioners of the United States, that no case terminated fatally where salivation was induced; and, with a view to the production of this salutary effect, mercury was introduced into the system, in every possible form, and cold applications were freely made use of, whenever the disease appeared to have a particular local determination. The experience of succeeding years, which have been, unfortunately, marked by a return of this calamitous visitation, has confirmed and established the safety of this practice.*

* Other instances might be adduced to establish, under certain circumstances, the safety of cold applications while the patient was under the specific action of mercury. In his account of a case of Tetanus, in which it was judged necessary to plunge the sufferer into a cold bath, Dr. Currie remarks that, "though he was in a salivation when thrown in, yet this was not stopped suddenly; it lessened indeed immediately, and soon disappeared; but without any of those bad consequences so well described by Sir John Sylvester and Dr. Dobson."

Mr. Nagle, surgeon of his Majesty's ship *Ganges*, in detailing his successful treatment of the West India fever, observes, that he generally used calomel as a cathartic, and frequently induced a salivation. "But even in these instances," says he, "I never hesitated to use the cold affusion, on the febrile heat recurring, and I never saw any injury from the practice."—Currie, p. 523.

Necnon, à condiscipulo Artis Medicæ perito, audiivi eum sæpius glaciem in pulverem redactam bubonibus syphiliticis adhibuisse, supurationi occurrendi causâ; & cum eventu quam maximè secundo, etsi

Dr. Currie, in his second volume, expressed an opinion, that the practice of cold affusion might be found efficacious in this dangerous disease; and recommends it to his American brethren as an useful auxiliary to the remedies in general adopted by them, and of which they have too often cause to lament the inefficacy. He appears to think that the practice has not had a fair trial; and it cannot be maintained that it has, in the precise mode in which he recommends it, although Cold in other forms has been so extensively administered. I have however little hesitation in believing that, in that form of yellow-fever in which the heat of the external surface of the body is so greatly increased as to constitute the genuine *causus*, (which is the only one in which the use of cold affusion would be attended with probable advantage,) the violence of the re-action would, in many instances, either accelerate a fatal catastrophe, or render its repetition necessary every few minutes: which, as has been observed upon a

æger, eodem tempore, variis ex hydrargyro præparatis, et internè & externè utebatur.

former occasion,* might be highly inconvenient and distressing to the patient, and in its permanently refrigerating effects, must still be far inferior to those resulting from the long-continued and varied application of Cold, of which an account has been given in the present section.

* See Note to page 24.

CHAP. IV.

OF THE USE OF COLD IN THE PHLEGMASIÆ.

SECTION I.

OF ITS USE IN PHLEGMONE.

IT will be unnecessary to enlarge upon the utility of cold applications, in producing resolution in Phlegmone. Their efficacy has been long acknowledged. Perhaps the saturnine applications, which are so generally made use of, operate as much by reducing the temperature of the inflamed part, as by any other property which they may possess, whether stimulant or astringent.

SECTION II.

OF ITS USE IN OPHTHALMIA.

TO multiply authorities, in order to establish the efficacy of cold applications in *Ophthalmia*

Membranarum, would needlessly protract this Essay. Even ice has been used with advantage, after proper evacuations.* The effects of a cataplasm, moistened with cold water only, in such cases, have induced me to adopt, with considerable conviction, the opinions already advanced, with respect to the external operation of the preparations of lead. In the commencement of the disease, I believe that the former application is fully as efficacious as the latter.† In its more advanced stage, the stimulus of the lead may exert a salutary agency, by promoting the absorption of the effused fluid. In *Ophthalmia tarsi*, the constitutional treatment will, in general, be necessary.

SECTION III.

OF ITS USE IN PHRENITIS, CARDITIS, GASTRITIS, ENTERITIS, HEPATITIS, SPLENITIS, NEPHRITIS, CYSTITIS, AND HYSTERITIS.

I have classed the above diseases under one head, in order to avoid too frequent a division

* Medical and Physical Journal, Vol. IV. p. 108.

† The Pharmacopœia Chirurgica, and the valuable experiments of Mr. Baynton, of this City, may be referred to in support of this opinion.

of the present chapter. In many of them, I have collected facts which establish the salutary effects of refrigerant applications; and, as they all agree in the phenomena of active inflammation, such applications may perhaps admit of further extension from analogy. The free use of cold, constitutes an important article in the antiphlogistic regimen necessary in Phrenitis. The determination of disease to the head in inflammatory fevers, would, perhaps, be most effectually prevented by cold applications. How frequently Synocha has such a determination, may be judged of from the remarks of Dr. Wilson, on the very imperfect diagnosis between this disease and Phrenitis, a difficulty evidently caused by this tendency.* When the disease was already formed, napkins wetted with cold water and frequently renewed, or ice inclosed in a bladder, applied to the bare scalp, as has already been mentioned under the head of Yellow Fever, would be found of singular efficacy in calming the fury of delirium, and abating

* Wilson on Febrile Diseases, Vol. I. p. 325.

See also some interesting particulars which prove this, in a valuable paper, from which I have already made a quotation in the preface to this work,—Medical and Physical Journal, Vol. XI. p. 21.

the distressing head-ach, which are its characteristic symptoms.

I have not been able to collect any facts relative to the operation of cold applications in Carditis or Gastritis. In the former, no advantage could be expected from them, unless the surface were affected with preternatural heat, and in such a case, they would, of course, only relieve the urgency of that particular symptom. In the latter, the irritability of the stomach would, in general, prevent the introduction of cold water in a sufficient quantity to produce any effect; otherwise it might exert a two-fold operation; at once diluting the acrimony of any offending cause, if such existed, and cooling inflammation by its specific action. In Enteritis, cold applications would perhaps be adopted, when their efficacy in hernia, which is such a frequent cause of this affection, is recollected. It will hereafter be seen that they are attended with singular advantage in that inflammation of the internal coat of the intestines, which is accompanied by dysentery, and they are probably equally safe, when the external one is affected in a similar manner. Besides, it is well known

that costiveness is one of the characteristic symptoms of this complaint ; and we shall find hereafter, that the application of cold is peculiarly efficacious in obviating this affection. In a case of Enteritis that came under the care of the author, a short time since ; where the whole abdomen was exceedingly hot, and exquisitely painful to the touch ; he ordered it to be bathed with wet napkins, wrung out of cool water, with evident advantage, and relief to the patient. It must, however, be remarked that the disease in this instance, was beginning to yield to the use of other antiphlogistic remedies, and its salutary effects appeared to be confined to a temporary diminution of painful sensation : there was also reason to suspect, that except at such times as the author was present, the remedy was not administered with due regularity or perseverance. In Hepatitis and Splenitis, the disease is, in general, too deeply seated, and the heat of the surface of the body, is in many instances, too little increased, to admit the hope of any advantageous effects from reduced temperature. In Nephritis, especially when of a chronic nature, cold applications have been found advantageous ; and patients affected with

this complaint, have derived great benefit in warm weather, from wrapping a wet towel round their loins, soon after rising from bed.* The application should be repeated two or three times. I have not met with any authorities for the employment of cold applications in Cystitis ; but it would seem probable that their external use might be attended with considerable advantage, for it will be seen in another part of this volume, that they are very effectual in the relief of *Ischuria*, which is so often a concomitant of this affection ; and as solutions of substances possessed of considerable activity, have been sometimes introduced into the bladder, not only with safety, but with benefit, might not cold water be injected in such affections ? Where the disease, as is frequently the case, originated from the irritation of calculus, the practice could not be expected to be of any avail ; but it might be efficacious in that slighter or rarer degree of it, produced by other causes, or existing in an idiopathic form.

* *Zoonomia*, Vol. II. p. 43.

Mercurialis bathed himself in the river Arnus at Pisa, and thereby cured himself of the stone in the kidneys ; and he advises the nephritics to place their backs against the stream of the river,—*Floyer on the Cold Bath*.

It remains to speak of the effects of cold in Hysteritis. Instances will be met with in a subsequent part of this volume, under the head of Hæmorrhagia Uterina, which evince the safety of refrigerant applications to the organ which is the seat of this disease; and if it be regarded as a symptom of, or complicated with puerperal fever,* the authority of Mr. White may be adduced in support of a cool regimen and cold applications under such circumstances.

It will be unnecessary to pursue this division of the Phlegmasiæ further, by noticing the Peritonitis,† and the other more minute ramifications into which some nosologists have distributed diseases of this class, according to the

* The difficulty of the diagnosis, in many cases, between Hysteritis and Puerperal fever, may be estimated from remarking the discrepancy of opinions between two practitioners of such extensive experience as Dr. Lowder, and Dr. Denman. Dr. Lowder observes, that in Puerperal fever the lochia will go on, but not in Hysteritis, and offers the suppression, as a diagnostic symptom. Dr. Denman remarks that, “inflammation of the uterus is far less dangerous than an equal degree of inflammation of any of the viscera of the abdomen, especially in the state of child-bed, because the uterus, readily admits of the return of the lochial discharge, which always affords relief, and sometimes cures the disease.”

† Of which it may be briefly remarked, that it is considered by some authors as the principal seat of disease in the fever already alluded to; as appears from their assigning to it the appellation of Peritonitis Puerperarum.

viscus supposed to be particularly affected. For the more extensively the works of practical writers are consulted, the more obscure and difficult will the diagnosis of a great proportion of them appear ; and even if it could be ascertained, it would be comparatively of small importance, as those diseases whose symptoms are with such difficulty discriminated, will be found to demand similar remedies.

SECTION IV.

OF ITS USE IN CYNANCHE.

THE Cynanche tonsillaris affects particularly the young and sanguine, and has been generally acknowledged to be an inflammatory disease. If it be so, is there not an error in the mode of treatment, at present, most generally adopted ? Some modern practitioners have, as will be seen hereafter, relinquished the use of flannel and warm applications, which have been so universally recommended in the treatment of gout and rheumatism, and have admitted cold air, and in some instances cold water, with the hap-

piest effects to the inflamed limb. If the relief experienced from this plan of treatment, should prove that applications of the former kind have been recommended without sufficient reason, may not their use in Cynanche be hereafter discovered to be equally erroneous? Might it not be useful in many cases rather to expose the throat to cold air, than to protect it from it; or might not even cold water be applied with advantage?*

In the Cynanche parotidea, cold has, in general, been scrupulously avoided. Dr. Darwin has judiciously divided this disease into two species. The one he calls *parotitis suppurans*, the other *parotitis mutabilis*. The former is distinguished by the acuteness of the pain and the presence of inflammatory fever; and in this he recommends the admission of cool air, with other articles of the antiphlogistic treatment, to be continued as long as it is necessary to relieve

* I was much gratified upon meeting with a confirmation of this idea, many years after proposing the above query. "In northern climates, according to Dr. Rogers, this disease is treated by rubbing the outside of the throat with ice."—Medical and Physical Journal, Vol. VI, p. 109.

the violence of the pain.* This form of the disease occurs not unfrequently, although it be in general of a much milder nature.

SECTION V.

OF ITS USE IN PNEUMONIA, AND CATARRH.

IN Pleuritis, or, as it is called by some practical writers, the true pneumony, the propriety of a cool regimen seems generally admitted. Upon this point, Sydenham and Darwin, Cullen and Brown unite their suffrages. The latter particularly inculcates its importance, and extends its use to the false pneumony also. Dr. Cullen, on the contrary, recommends cold to be guarded against in the treatment of this last disease. But wherever the heat of the skin was an urgent symptom, I should be strongly disposed to adopt the plan of Dr. Brown. Two instances are recorded in the Medical and Physical Journal, which might seem to justify such a procedure. In these the symptoms of

* Zoonomia, Vol. II. p. 227.

Peripneumonia and Typhus were so combined, as to constitute the Peripneumonia Putrida of Sauvages; but, notwithstanding the objections which were excited by the presence of pulmonic symptoms, the reporter, Mr. Martineau, administered the cold affusion. And he observes, that although no very immediate relief was given, there arose no inconvenience from the application of cold water.

But a far more decided evidence in favor of the safety of cold affusion, when symptoms of pulmonic inflammation are present, may be collected from the second volume of Dr. Currie's Reports. Dr. Reeve, in a letter addressed to him, detailing the wonderful success of the cold affusion in the clinical ward of the Edinburgh Infirmary, thus expresses himself. "The most important point, as you have justly remarked, which required to be established by experience alone, was, the safety of employing the affusion in cases of fever combined with symptoms of local inflammation. Now the frequent trials made at Edinburgh, afforded most satisfactory results upon this subject. *Not one of the patients who had symptoms of catarrh, or inflam-*

*mation of the lungs, suffered the least inconvenience from the cold or the tepid affusion: none of their symptoms were aggravated or increased by it, but on the contrary, most of them were relieved."** Dr. Bree, physician to the General Hospital and Dispensary at Birmingham, in a report on the condition of the poor there, as far as respects health and disease, observes,† that he had sometimes used the aspersion when a cough accompanied the fever, and though he was timid in this practice, he had reason to think that it was beneficial. Dr. Trotter and Mr. Magrath, give a similar testimony; and Dr. Gomez, physician of the Portugueze fleet, declares that the combination of catarrhal affections with the contagious fever, did not prevent the use of the cold ablutions, or impair their beneficial effects.

Although it is, in general, my intention to follow the arrangement of Dr. Cullen, yet catarrh appears to belong, so unequivocally, to the phlegmasiæ, that I shall include the few obser-

* Reports, Vol. II. p. 478.

† Page 483.

vations which I have to offer upon it, in the present section. The mistaken ideas with respect to its origin, are now, for the most part, exploded; and its treatment is conformed to the more rational conceptions, which are generally entertained of its cause. The name of this disease has probably been the source of much error in the treatment of it. A person who had, in the popular phrase, caught cold, was led by a mistaken analogy, to attempt its removal, by the use, or rather abuse of various stimulating substances. If the stimuli made use of, were capable of exciting an action superior to that of the disease, this plan succeeded; although at the expence of a great waste of sensorial power, and consequent languor from indirect debility: but if the diseased action were unusually violent, it often transcended the artificial one, excited by the curative agent, however stimulating; and the irritation of the system was uselessly increased.

Dr. Brown repeatedly asserts in various parts of his Elements, that the simple application of cold is sufficient for the cure of catarrh.

I have known an instance, where a person of a constitution far from robust, has completely obviated a violent attack of incipient catarrh, by wetting the hair previously to retiring to rest. The evaporation had, by the morning, completely taken down the morbid excitement, and extinguished the inflammation of the mucous membrane; so that no symptom of disease remained.

The following case, which I extract from Dr. Beddoes's *Hygieia*,* is strikingly illustrative of a similar principle. "A boy in the service of Dr. Hamilton, of Ipswich, with considerable cough and febrile heat, played the truant one evening in February, 1797, and passed the whole night, walking or sitting in the streets. The night was the coldest of that season; the thermometer, at 7 o'clock the next morning, standing at 10 degrees below the freezing point. The boy's complaint appeared to Dr. Hamilton somewhat alarming; and he felt considerable uneasiness lest it should increase, from his being first heated, as he presumed, by play, and

* Vol. II. p. p. 74. and seq.

then suddenly cooled by the frost. During the interrogation he underwent next morning, he observed that he did not cough once ; although in the same space of time, ever since the commencement of his catarrh, the cough would have often harassed him, and interrupted his narrative. He watched him narrowly, as he apprehended that a fever might be the consequence of his midnight ramble. But here he was agreeably disappointed ; for, instead of fever, his catarrh was cured, his cough ceased, and never afterwards returned.”

In epidemic catarrh, or influenza, ice has been advantageously used in the western hemisphere ; and Dr. Kinglake has recorded the benefits derived, from a cool temperature, and cold drinks, in the same disease, in our native country.*

Dr. Currie subjected himself under an attack of this complaint, to the action of a shower-bath, of the temperature of 85 degrees. Although this may appear comparatively warm, yet from its conducting power, water of that

* Medical and Physical Journal, Vol. IX. p. 519.

temperature would produce a sensibly refrigerating effect. He observes, that he tried this remedy, in consequence of finding that no plan of treatment which he had hitherto pursued, had materially shortened the disease. Although subject himself to pulmonary affection, no unpleasant symptom followed, but he recovered more speedily than any of his patients.

SECTION VI.

OF ITS USE IN GOUT AND RHEUMATISM.

THE alteration in the plan of treatment hitherto generally pursued in cases of rheumatic and arthritic affection, has been already cursorily hinted at. The gout will not perhaps continue to be numbered among the *opprobria medicorum*, when the use of cold applications shall be more generally substituted in the room of the venerable prescriptions of patience and flannel. Yet, if antiquity were allowed to decide the point in question, it might be observed that the exhibition of diminished temperature is sanctioned by the authority of the great father of

medicine. He speaks expressly of the advantage of plentiful affusion of cold water, in diminishing the pain of gouty swellings of the joints.* Celsus also gives a similar testimony in his section "*De manuum & pedum articulorumque vitiis.*"† If we descend to the medical records of our own times, we shall find that doubts with respect to the propriety of a warm regimen and warm applications to the arthritic limb, were entertained by one whose authority is justly respected, as that of a patient and accurate observer of diseases, and whose practice was rather characterized by cautious circumspection than by venturesome presumption. "I never could see" says Dr. Heberden, "any reason for adding at all to the usual covering of the limb, unless extraordinary tenderness, or the severity of the weather, might make a very little more, necessary to keep off the sensation of cold, so disagreeable to a part which is swelled and in pain."‡ In another part of the same section, he informs us, that "the great Dr. Harvey, upon the first ap-

* Hippocrates *De Humidorum usu*, p. 605, tom. I.

† Krause's Celsus, p. 238.

‡ Where active inflammation exists, I apprehend that the sensation of cold would be found rather grateful than otherwise.

proach of gouty pains in his foot, would instantly put them off by plunging the leg into a pail of cold water." He, however, adds afterwards, that he does not recommend the example of Dr. Harvey to be imitated, " although it is known that he lived to a good old age." In his concluding paragraph he remarks, that the time may come when the Gout will be treated more as an inflammatory distemper. It is true that these remarks afford no decided testimony in favor of the plan which I should be disposed to recommend, but they may be adduced in evidence of this sagacious physician's dissatisfaction with the ordinary routine of the practical treatment of Gout.

The instance which he has adduced of the adventurous practice adopted by Dr. Harvey in his own case, is paralleled by one recorded by Mr. Wadd, in the ninth volume of the Medical and Physical Journal. The authority of one who had used cold water in Gout, externally and internally, for nearly twenty years—externally by wet cloths and immersing the limb, in the approach and every stage of the fit, must be acknowledged to be entitled to attentive

consideration, especially when it is recollected that he was himself the subject of the experiments which he relates.

Dr. Rush in his treatise on Gout,* gives us an instance of the safety of the application of cold water to the inflamed limb, in the case of a gentleman who habitually used it to relieve the intensity of pain, without the advice of a physician. The gentleman alluded to is known by the author of this Essay, to be advanced in life, of a plethoric habit, and but little accustomed to active exertion. He is also a native of Ireland, and habituated to the exercise of the generous hospitality characteristic of his countrymen. He cannot, therefore, be deemed a favourable subject for an experiment attended with hazard ; yet, in his case, the practice has been uniformly salutary. The learned professor, however, does not himself venture to recommend it in all cases ; although he strongly insists upon the propriety of uncovering the limb, and admitting the cool air. “ The safety and advantage” he observes, “ of both these modes of applying cold to the

* Medical Inquiries and Observations, Vol. V.

affected limbs, (*viz.* cold air, and cold water,) shew the impropriety of the common practice of wrapping them in flannel.”

A variety of experience has been lately submitted to the public in the Medical and Physical Journal, tending still more strongly to establish the efficacy of refrigerating applications, both in rheumatic and arthritic inflammation: and in only one instance have the opinions thus advanced, awakened the keenness of controversy. Dr. Kinglake first invited the attention of his medical brethren to the subject in the thirty-third number; and detailed a variety of interesting cases, to which he afterwards made further additions. His invitation was answered by a number of communications tending to establish the truth of the theory, and the efficacy of the practice which he had adopted and recommended.* The general result of these testimo-

* The remarks of Dr. Kinglake were combated by a writer in the same work, under the signature of a “Constant Reader.” In order to invalidate, as it should seem, the authority of the multiplied facts adduced to establish the efficacy of the practice alluded to, he asserted, that the late Dr. Gregory, of Edinburgh, was found dead in his bed, the morning after a friend of his (the writer) had called upon the professor and found him bathing his feet in cold water, in a paroxysm of Gout. This statement was contradicted in the volume of the Annals of Medi-

nies is, that cold water may be applied to the inflamed limb, with the most perfect safety and advantage, not only in the young and plethoric, but in patients advanced in life, and debilitated in constitution; that its efficacy was evident, even where no internal medicine was administered; that it was equally efficacious, not only in distinct rheumatic and arthritic affection, but in those cases where the disease appeared to be of a complicated nature; and that the heat of the inflamed parts was in some instances so excessive, that evaporation took place from the moistened cloths, as rapidly as if they were held before a large fire. The case of a patient is recorded, who, having with difficulty walked with a stick for a hundred yards, kept his foot for ten minutes, exposed to a stream of cold water issuing with great force from a large cock. He

dicine, for the same year. To this mistaken fact the Constant Reader prefixed a supposition, which, in all probability, is equally destitute of foundation. "The illustrious Harvey," says he, "discoverer of the circulation, used to plunge his feet into cold water, to mitigate the severity of painful paroxysms of the disease; it has even been said, that he shortened his life by this practice." We are not informed by whom this opinion has been entertained; but it is rendered rather improbable by the fact, that the illustrious character in question, lived, as has been already observed, in the quotation from Dr. Heberden, "to a good old age." The history of his life informs us that he attained his eightieth year. He was born on the 2d of April, 1578, and died June 30, 1657.

found such immediate relief, that he threw away his stick, and walked to his house with ease.— The cases alluded to amply merit the perusal of every medical practitioner, and I should enter into a further detail upon the subject, were the work in which they are contained less generally perused, or less extensively circulated. I shall conclude the subject by observing that an intelligent practitioner in this city, informs me that he has long been in the habit of using refrigerant applications of various kinds, to allay arthritic inflammation, both in his own case and in that of others ; and that this practice has been attended with signal benefit ; although, in order to obviate alarm, he has so far consulted the prejudices of his patients, as to disguise the nature of the application by various unimportant additions.*

* Since writing the above, I have received a letter from a medical friend of great information and sagacity, who, in giving an account of an attack, from which he had not long recovered, thus expresses himself. " In my last fit of the gout, I was affected both in my hand and foot. I poured cold water on the former, with instantaneous benefit, and exposed the latter to cold air, with similar advantage."

CHAP. V.

OF THE USE OF COLD IN THE EXANTHEMATA.

SECTION I.

OF ITS USE IN SMALL-POX, MEASLES, AND MILIARY FEVER.

SOME of the most interesting facts with respect to the operation of diminished temperature may be met with, in tracing the history of the ancient and present modes of treatment in the small-pox. It is scarcely to be wondered at, if apprehensions were entertained, that some ill consequence might attend the repelling of an eruption which seemed to be critical; and the appearance of which, was so generally attended by a remission of some of the more urgent symptoms of the disease. The idea that nature was, by an elaborate process, eliminating from the system something impure and injurious; and the increased eruption, which would be generally observed to accompany an in-

crease of the warmth of the patient, would add to this alarm. It was therefore, naturally to be expected, that when a disease of this class occurred to the physician, he should endeavour, by a stimulating temperature, to assist as far as he could, this supposed salutary operation of nature. Some solitary facts would indeed occasionally occur, which might lead the careful observer, to distrust this reasoning, however specious, and to recognize the advantages arising from a cool regimen. It sometimes happened that in the delirium of disease, the patient sprang from his bed, eluding the vigilance, or overcoming the opposition of his attendants, and this act of frenzy was followed by strikingly beneficial consequences.* And in some rarer instances, after the sufferer, oppressed by an unusual load of bed-cloaths, and the impure atmosphere of a chamber violently heated, had been supposed to have heaved his last sigh; returning animation, and a fortunate crisis followed the removal of the coverings, and the admission of pure air into the heated apartment.

* "I have met with some instances of persons in the Small Pox who cured their frenzy by leaping into cold water."—*Sir John Floyer*, p. 143.

By some sagacious practitioners, these facts were not only noticed, but properly applied; yet although Sydenham, Mead, and Friend, so earnestly recommended the adoption of the cool regimen, their opinions made so slow a progress, that there are many persons now living, whose very existence has been endangered, and their constitutions irreparably impaired by a contrary treatment: and the practitioner, who has occasion to witness the maladies of the humbler classes of society, has too frequently cause to lament, even in the present day, that the slow progress of information amongst them, causes numerous annual sacrifices to the same destructive prejudice.

Since the introduction of Vaccination, it might seem almost unnecessary to say more of a loathsome disease, the final extermination of which, may now be confidently hoped for. But the brilliant discovery which has immortalized the name of Jenner, has not yet entirely subdued opposition; and it may be useful to remark, that although the use of cold in Small-Pox is well established, this regimen might, perhaps, be advantageously pursued to a greater

extent than has hitherto been, in general, attempted.

The following facts give countenance to this opinion. Twelve or fourteen children, belonging to some soldiers, in a regiment which was marching from Glasgow to the Highlands, were seized on the road with the small-pox.—The weather turned out remarkably cold, with a constant rain during the march, and the children being carried on horseback in open panniers, with little more than a single blanket to defend them from the cold and rain, the surgeon of the regiment was under some apprehension of bad consequences from a situation so much exposed. His fears, however, were ill-founded, for all the children had a mild and distinct sort, more like the inoculated than the natural small-pox, and they soon recovered.*

Many years ago, a fire happened at Blandford in Dorsetshire, which consumed great part of the town. Among the sufferers were above thirty persons afflicted with the small-pox. They were accommodated with cots or ham-

* Gardiner on the Animal Oeconomy, p. 106.

mocks, or by other similar means, under the bridge; lying openly exposed to a stream of cold air, and they all did perfectly well.*

Dr. Baynard informs us, that a young man in the delirium of small-pox, while his nurse was asleep, jumped out of bed, ran down stairs, and rushed into a pond. The noise awoke her, and she followed with an outcry which raised the whole family; they surrounded the pond, but he parlied with them, and threatened that if any body followed him in, he would certainly drown him, adding, that he would come out when he thought proper. He accordingly did so; walked up stairs, and sat in his wet shirt, upon a chest by the bed-side; in which situation he remained till the arrival of his apothecary, who had been sent for from a distance of three or four miles. No inconvenience appeared to have followed his immersion, and he speedily recovered.

Cold bathing is frequently practised by Europeans in hot climates, with a view to moderate the violence of the eruptive fever. And it

* Rowley on the Causes of death in Putrid and Scarlet Fevers, p. 17.

is said that, in the East-Indies, the adoption of this practice has been found to cause pustules that have a flaccid and unfavorable appearance, to become well filled and more prominent. Dr. Currie's valuable work furnishes us with a case of its successful application in similar circumstances, in our own country.*

Facts, such as these, are striking and impressive; but, if the prejudices of the patient, or the timidity of his attendants, prevent the application of the principle to the extent here mentioned; they may, at least, authorize and encourage the universal adoption of a frequent application of cold water to the face and eyes. The destruction of personal beauty, and the loss or weakness of the sight, may be thus safely and effectually prevented.

The Varicella or Chicken-pox, is in general too unimportant a disease, to render any remarks upon its medical treatment necessary in this place. I shall therefore immediately proceed to the Measles.

* Reports, &c. p. 53.

It does not appear sufficiently obvious, why this disease should not be treated in the same manner as the small-pox. Fears have been entertained that the application of cold, to use the common phrase, causes the measles to strike in; but Dr. Brown strenuously denies that such an effect is ever produced, and enters fully into a vindication of a cold regimen in this disease.*

Dr. Cullen has an observation which seems to confirm this idea. "It has been an unhappy opinion," says he, "with most physicians, that eruptive diseases were ready to be hurt by cold; and that it was therefore necessary to cover up the body very closely, so as thereby to encrease the external heat. We now know that this is a mistaken opinion; that encreasing the external heat of the body is very generally mischievous; and that several eruptions not only admit, but require the application of cold air.†

A cold regimen in Measles, would appear to be particularly indicated, if the experience of

* Elements of Medicine, Vol. I. p. 80.—II. Sect. 446.

† First Lines, Sect. 723.

other practitioners should induce them to reply in the affirmative to the following query of Herberden. "Is not this distemper;" he asks, "worse in proportion to the quantity of the eruption, as in the small-pox?" * If this were observed to be generally the case, it is obvious that the violence of the eruption would be beneficially restrained by similar means.

In his account of the measles which prevailed in Philadelphia, in the year 1789, Dr. Rush observes that, "in the admission of fresh air, he observed a medium as to its temperature, and accommodated it to the degrees of action in the system. In different parts of the country in Pennsylvania and New Jersey, "I heard," says he, "with great pleasure, of the *cold air* being used as freely and successfully in this disorder, as in the inflammatory small-pox. The same people who were so much benefitted by cool air, I was informed, drank plentifully of cold water, during every stage of the disorder. One thing in favor of this country practice, deserves to be mentioned; and that is, evident advantage arose in all the cases that I attended, from pa-

* Commentaries, p. 322.

tients leaving their beds in the febrile state of this disease. But this was practised only, by those in whom the inflammatory diathesis prevailed, for these alone had strength to bear it."

Before the publication of Dr. Currie's second volume, I had not met with any cases of sufficiently decided authority, on this side of the Atlantic, to enforce the adoption of a similar practice; yet some of the objections to it appeared evidently to proceed from mistaken grounds. In a late popular compend of practical medicine, it is remarked, that "though the analogy with the small-pox, might lead to the application of cold air during the eruptive fever of the measles, the analogy with catarrh seems to be against the practice." The reader who adopts the modern opinion with respect to the origin and treatment of catarrh, and who attends to the case already detailed under that head in the present Essay, will not be disposed to allow much weight to an objection derived from this source.

If the presence of catarrhal or pulmonary symptoms, have, as is probable, presented the

most formidable obstacles to the general adoption of a cool regimen ; the multiplied instances which Dr. C. adduces, (and of which a summary has been presented in a former section,) of the safety, even of cold affusion, when such symptoms accompanied other diseases, may probably mitigate, if not entirely remove, any apprehension arising from their presence in that under consideration. But actual experience may be cited in support of analogy ; for Dr. Currie informs us, that, although he should not have been inclined to have prescribed it (*the cold affusion*) intentionally in the measles, on account of the disposition to pulmonary affection which attends that disease ; it has happened to him, to have directed it, by mistake, four different times in the eruptive stage of measles ; and the disease that followed was singularly mild in every instance.

It is at present pretty generally admitted, that the miliary fever owes its origin to the improper application of a warm regimen. Hence this affection may almost always be prevented, by avoiding such an error in the treatment of febrile diseases. When formed, it requires the

admission of cold air, and cold drink ; with this caution only, that the alteration of temperature should be gradual. Nor is this practice to be avoided, from a fear of checking the sweat which accompanies this eruption ; for this sweat is the offspring of debility, and is not, by any means, critical. Where the disposition to the eruption appears, the application of cold should be as free as the symptoms of the fever will admit of ; and its formation will, by such means, be prevented. The origin and treatment of this disease are so satisfactorily illustrated by Mr. White, in his treatise on the management of lying-in-women, that nothing can be added to his remarks upon the subject. They furnish the most ample testimony, that reduced temperature is equally effectual, either in its prevention or cure, and the facts detailed must tend to disarm the apprehensions, still too generally entertained, of the consequence of repelling cutaneous eruptions. They prove, moreover, that the appearance of a truly critical eruption, is not checked by cold air or cold liquors, but rather promoted by them ; and that the nearer the heat of the body is brought to the standard of health, the sooner, and the more

easily will nature be enabled to throw off her burden. In confirmation of this opinion, he has recorded a curious and instructive case of a patient, who, in the sixth month of her pregnancy, was seized with a severe fever, which produced a miscarriage on the eleventh day. In the early part of her disease, she had a plentiful miliary eruption, in consequence of having been confined to her bed in a close and heated apartment. The use of cold drinks, and the free admission of cool air, caused it to die away. On the eighteenth day of the disease, another eruption took place, which had all the appearance of being critical, and which differed very materially from a miliary eruption. This occurred (after she had been twelve entire days without sweating,) on the coldest parts of her body, as the legs, and outside of her arms, though she lay constantly with her arms out of bed, and exposed them as much as possible to the cold air of the window, close to which the bed was placed. It is further remarkable, that none of them appeared upon her body, which was, of course, covered up, and that they were not at all checked by the cold air, or the damps

of a wet night which succeeded their appearance.*

SECTION II.

OF ITS USE IN SCARLET-FEVER, PLAGUE, AND ERYSIPELAS.

THE reader will perhaps observe, that I have not exactly followed the order in which the diseases, which are the subjects of this section, are placed in the Exanthemata of Dr. Cullen. So many different opinions have been entertained, with respect to the propriety of their situation, and the analogy between diseases placed next in order to each other, is often so imperfect, that I have ventured to make this alteration. The name of Scarlatina is applied to diseases of very different degrees of malignity. It is observed by Dr. Darwin, that it exists with every grade of virulence, from a flea-bite to the plague. In the mild or incipient state of this distemper, cool air may sometimes be sufficient to mitigate its symptoms; but cold water would be far more certainly efficacious. Indeed, the valuable reports of Dr. Currie, have proved that the cold

* Cullen's First Lines, Sect. 727, 728.—White on Management of Lying-in Women, fifth edition, p. p. 244, 272.—Zoon. Vol. II. p. 247.

affusion extinguishes the incipient Scarlatina, as effectually as it does Typhus. The reader is referred to his work, for numerous interesting facts on this head, and for some ingenious reasoning, which would perhaps authorize, by analogy, the extension of the use of cold water to all the Exanthemata. It appears that in some of these cases, the disease was extinguished without the specific efflorescence of the skin, or affection of the throat. It would be an interesting and important subject of inquiry, to ascertain whether, when it is thus arrested in its forming state, without the developement of these specific symptoms, the constitution be rendered unsusceptible of any farther attack of the same disease.* In his second volume he

* Dr. Baynard has recorded two curious cases, in which the early application of cold water seems to have had an effect equally decided in extinguishing Small Pox, as in arresting Scarlatina in the instances related by Dr. Currie. His words are as follow: "I remember about two years since, a learned gentleman, a divine, told me that in the country where he was beneficed, in a small town, not far from him, many died of a malignant Small Pox. A certain boy, a farmer's son, was seized with a pain in his head and back, vomited, was feverish, &c. and had all the symptoms of the Small Pox. This youth had promised some of his comrades to go a swimming with them that day, which, notwithstanding his illness, he was resolved to do—and did go; but never heard any more of his Small Pox. Within three or four days, the father was seized just as the son was, and he was resolved to take Jack's remedy; his wife dissuaded him from it, but he was resolved upon it, and did immerse in cold water, and was after it very well."

details a great variety of cases, which still further illustrate the importance of this remedy ; and delivers a valuable observation with respect to the temperature of Scarlatina, which he asserts, from actual admeasurement, to be the hottest of all the febrile diseases of this climate. This fact will account for the peculiar efficacy of the cold affusion in its medical treatment. He also inculcates, from the examples of his own children, the necessity of repeating the affusion as often as the violence of the reaction demands it. It was administered to his eldest son, a boy of five years of age, fourteen times in thirty-two hours : eight times with cold, twice with cool, and four times with tepid water. His brother, who was only three years of age, had twelve affusions, of which seven were cold. The learned professor of the practice of medicine in the University of Edinburgh, has also furnished Dr. Currie with an interesting letter, detailing the treatment of three of his children ; two of whom recovered, with the use of no other remedy than the cold water, from a violent attack of Scarlatina ; and the third had only three grains of calomel, and a couple of leeches applied, in addition to this active remedy. The evidence fur-

nished in these and other instances is so decided and satisfactory, that it is scarcely necessary to cite further authorities in behalf of the practice. The attacks which gave way to the remedy, threatened great malignity in their onset; but these unfavourable symptoms soon vanished.

In the more advanced stages of the disease, ablution with cold or tepid water is equally grateful and salutary. Several valuable observations in proof of this, may be seen in the eleventh volume of the Medical and Physical Journal. They are recorded by the ingenious Dr. Reid, physician to the Finsbury Dispensary. It may, perhaps, be objected that the instances of the successful employment of tepid water, do not apply to the subject of the present Essay. But, it may be observed in reply, that it is of little importance, whether the water be cool or tepid, provided the patient be freely exposed to the air: for the excessive action of the skin, will be almost as effectually diminished by the evaporation of tepid, as by the original affusion of cold water.

Upon reviewing the cases recorded by Dr.

Currie and Dr. Gregory, and tracing the violence of the reaction which rendered such repeated affusions necessary, it may perhaps appear probable, that the continued application of napkins or sponges wrung out of cold water, would be equally efficacious, and in most cases, more convenient than the mode adopted by these gentlemen. I apprehend that no salutary consequences are expected from the shock which must necessarily be produced by the affusion ; and surely the burning heat of the surface of the body, might be expected to be more completely extinguished by the persevering application of the remedy, than by its momentary exhibition. Familiar experience illustrates this position. The affusion of a shower-bath, or a sudden plunge into cold water without continuing the immersion, is followed by a glow of heat, which is not perceived by those who have remained immersed for a considerable time ; even although they use the violent muscular exertions necessary in swimming or diving. Nor is there any reason to doubt that such a plan would be equally safe. In one of the examples related by Dr. Gregory, immersion was resorted to instead of affusion, and the effects were equally salu-

tary. Dr. Darwin has inserted iced lemonade amongst the articles of his *Methodus Medendi in Scarlatina Maligna*. This would probably be found particularly useful, where the affection of the throat was considerable.

The next disease to be considered is the Plague: a malady which is happily but little known in the more enlightened parts of Europe. Its history, therefore, is still, in some degree, imperfect: but it appears, from the testimony of many writers upon the subject, to be of a highly inflammatory nature. Of the propriety of the free admission of cold air, most authors appear to be convinced. There are many facts upon record, of its accidental, and others of its intentional cure, by cold water. During the great plague of London, in the year 1665, a brewer's servant, at Horsley-Down, in Southwark, was seized with it; and in his delirium, ran into a horse-pond; first drank his fill, and then fell fast asleep, with his head upon the brink; where he was found in the morning. How long he had been in the pond no one knew; for it was in the night that he went into the water, and he had then no nurse with him. He reco-

vered to a miracle, says Dr. Baynard, from whose work this account is extracted.

Dr. Rush relates the case of a man ill of the plague, who was travelling to Aleppo. The inhabitants denied him lodging for fear of infection; he was therefore obliged to pass the night in the open air. In this situation, the falling of a violent shower of rain completely wetted him, and in the morning he was perfectly cured.

Dr. Henderson, in his observations on the plague, observes, that "the use of cold water, or even water in which ice has been dissolved, will probably be of advantage in warm seasons, or when there is a tendency to an encreased secretion of bile." In another part of his work, he informs us that "the plague is said to have been cured, by exposing the patient to the dew and rain, and by throwing salt water over the body."

Monsieur Desgenettes, in his *Histoire Medicale de L'armée de l'orient*, relates that an artillery-man, who had two buboes and a carbuncle,

made his escape from the Lazaretto of Boulak, on the day of his being admitted, and in a violent delirium, plunged headlong into the Nile. He was taken up about half an hour afterwards, below Embabeth, by the people of that village, and he afterwards perfectly recovered.

The wealthy inhabitants of Smyrna preserve themselves in health by wetting their houses, whilst the plague is destroying thousands of their less opulent or provident neighbours. The water-carriers in Aleppo, who are in a constant state of humidity, escape the plague.

Even the dews which fall in Egypt about midsummer, are sometimes so plentiful, as to destroy this distemper entirely.* Of this a remarkable instance is recorded by Savary, in his letters on Egypt. A captain of a ship, a man of credit, had taken on board at Constantino-ple, some sailors affected with the plague, and caught the infection. The sequel is given in his own words. "I felt," says he, "an exces-

* Memoirs of Baron de Tott, Part IV. p. 70.—This fact, incidentally stated, in a work not connected with Medical disquisition, sanctions the opinion advanced by Dr. Currie, that "the dews of the night, are probably among the most powerful remedies in this distemper."

sive heat, which made my blood boil ; my head was very soon attacked, and I perceived that I had but a few minutes to live. I employed the little judgment I had left, to make an experiment. I stripped myself quite naked, and laid myself for the remainder of the night on the deck. The copious dew that fell, pierced me to the very bones ; in a few hours it rendered my respiration free, and my head more composed. The agitation of my blood was calmed, and after bathing myself in sea water, I recovered."

From these facts, and from the analogy which appears to exist between this disease and the yellow fever; an analogy which is so ably traced by Dr. Rush,* and which has received such additional confirmation from the account given of its origin, in the appendix to Sir Robert Wilson's account of the British Expedition to Egypt, and the treatise of Mr. M'Gregor ; it is probable that cold water and ice might be used in it, with advantages equal to those which have been derived from them in the yellow fever, if administered to an equal extent.

* Rush on Yellow Fever, p. 169.

Dr. Darwin recommends that currents of cold air, cold water, and ice, should be applied externally to the hot parts of the skin: probably such means would, in all cases, be effectual in the prevention of anthrax, which is so painful, and in many instances, so fatal a concomitant of this malignant distemper.*

It remains to make a few remarks upon the subject of Erysipelas. Notwithstanding the burning heat which so generally accompanies erysipelatous inflammation, the use of cold applications in such cases, has been interdicted by some writers, from their supposed dangerous effects. They have been particularly forbidden when the head and face are affected, from the fear of inducing phrenitis. It is highly probable that these cautions are mistaken and unnecessary. Enough has already been said upon the efficacy of cold applications, in obviating

* Consult Rigby on Animal Heat, p. 149.

Mr. Tytler, the compiler of the Medical part of the Encyclopædia Britannica, observes, that "this disease differs from all others, in having a more violent tendency to inflammation, insomuch that it amounts to actual accension." (*Treatise on Plague and Yellow Fever*.) Perhaps, this is the only fever in which the heat of the surface exceeds that of scarlatina; and there is every reason to believe, from the examples above mentioned, that it would yield to the same remedies, if applied in a degree proportioned to its greater violence and malignity.

febrile determination to the head. It will hereafter be seen that they are attended with signal advantage in apoplexy, a tendency to which, is included by some practical writers in their nosological definition of the disease under consideration.

Hippocrates observes, that cold applications are beneficial, when the eruptions do not suppurate, but are injurious when they do so.* Dr. Darwin remarks, that such external applications as carry away the heat of the skin, as cold water, cold flour, snow, and æther, may be of service. Mr. Rigby recommends that the part should be covered with linen rags moistened with water, which should be renewed without taking them off, as often as they become dry.†

A writer in the Medical and Physical Journal, observes that “ he does not recollect one case where cold lotions properly applied, did not prevent suppuration and all its consequences, not only in the head and face, but the extremities :” “ in the former,” he continues, “ I have used it

* Aphorism 23, Sect. 5.

† On Animal Heat, p. 126.

very freely and repeatedly, when the inflammation has run extremely high, both locally and constitutionally, and I never once found by repelling it, that either phrenitis, angina, or any unpleasant complaint followed."

SECTION III.

OF ITS USE IN THE PRICKLY HEAT.

BEFORE I finally quit the subject of the Exanthemata, it may be necessary to say a few words upon the prickly heat, an eruption which is exceedingly distressing to the natives of a temperate climate, upon their first removal to a warm one. With respect to the treatment of this affection, a very different testimony is given by Dr. Moseley, and Dr. Wade, in their histories of it, as it occurs in the West and East-Indies. Dr. Moseley recommends that cold bathing, or cold applications, should be cautiously avoided, for fear of repelling it.* Dr. Wade, on the contrary, assures us that the cold bath may be used with the greatest safety,

* Tropical Diseases, p. 20.

in the prickly heat, and other similar cutaneous eruptions.* This difference of opinion, is a proof of the uncertainty that still exists, with respect to the salutary or injurious operation of cold, in many eruptive diseases. Subsequent experience may perhaps prove, that all diseases of this class, so far obey a general law, that their violence may be safely extinguished by the same agents, which have proved so efficacious in disarming the malignity of small-pox, and scarlatina. One fact I shall beg leave to lay before the reader in this place, from personal observation. I feel no hesitation in believing that the irritation of the skin in prickly heat, is often highly salutary, by preventing febrile attacks, and disorders of the *primæ viæ*. But it has happened to me during my residence in a warm climate, to experience this affection repeatedly myself, and to see it in others, who, notwithstanding the fervour of a burning sun, habitually wore flannel next their skin. In such cases I have frequently seen the eruption very troublesome about the lower part of the throat, the

* *Medical Commentaries for 1793, p. 203.*—Sir John Floyer in speaking of the effects of his cold bath at Litchfield, has the following remark, “I observed, that some hot tempers had a rash produced by bathing, and they were eased of pain thereby.”

neck and shoulders, the thighs, and other parts not protected by the flannel : but I do not remember to have witnessed in others, and I am certain that I have not discovered in my own case, any affection of that part of the skin which was covered by it. The reverse of this should obviously be the case, if it were produced merely by heat applied to the surface, and were not rather a sympathetic irritation.* From these circumstances I should feel dubious, whether it would be readily repelled by cold. In one instance I repeatedly bathed without hesitation, while I was under the influence of a considerable degree of this eruption ; but I could not observe that the bathing diminished it in any degree ; nor was it succeeded by any inconvenience. As, however, the river in which I bathed was warmed by the rays of a meridian sun, at the time of my immersion, I cannot pretend to draw any deductions from a solitary case.†

* I do not mean to question the agency of a warm climate, in disposing to this affection, but I consider it as a secondary, and not a primary effect of the heat of the atmosphere.

† Since writing the above, I have had an opportunity of conversing with a gentleman who habitually wore flannel next his skin, during a residence of many years in the East-Indies. His experience coincides with the facts above stated. Although, he observes, bathing in the

It should seem that the doctrines of the humoral pathology, although nominally exploded, still continue to influence our reasoning, with respect to the *Exanthemata*. Some vitiated humour is still supposed to be driven back into the system, if an eruption be suddenly repelled. That morbid excitement on the surface, diminishes morbid action in the internal parts of the body, is unquestionable. Hilary informs us that persons in the West-Indies, much affected with the prickly heat, escape the yellow fever; and a similar observation has been made, with respect to the children in the cities of the United States; who, if they are troubled with this complaint, escape the cholera, which proves so formidable to infants during the summer months. But the relief or security experienced in such cases, must not be attributed to the ex-

prickly heat, is in general forbidden by the Medical practitioners in that country, he has bathed repeatedly while under the affection with perfect impunity. He remarks also, that the eruption was most particularly distressing on his arms, which were not covered by the flannel: but, he well remembers that his body was generally free from it; although his recollection is not sufficiently precise, to authorize him to declare that it was always so. Dr. Darwin advances an opinion that the wearing of flannel may produce erysipelas, or miliary fever, (*See Zoonomia, Vol. II. p. 23.*) The facts above stated, render this position questionable, and suggest a doubt, whether this acute physiologist has not condemned, without sufficient reason, the general adoption of this salutary article of cloathing.

pulsion of any thing injurious to the system, by the medium of the cutaneous vessels ; nor the ill-consequences which occur if the eruption be diminished, to its retention. No more happens here than takes place in other diseases, where we relieve diseased action in one part, by exciting artificial diseased action in another, less essential to life : thus, by applying blisters to the throat, the scalp, or the side, we relieve the internal inflammation, in cynanche, hydrocephalus internus, or pneumonia. But however desirable it may appear, the attempt to imitate the salutary process above alluded to, would be attended with considerable hazard ; for in our efforts to restore a suppressed eruption, we incur the risque of creating a true miliary fever, and thus exciting a general additional disturbance in the system.

In what has been observed, I do not wish to be understood as contending for the expediency, in all cases, of checking or removing cutaneous eruption. Analogy would teach us to regulate our conduct in this respect, according to circumstances. 'The same sort of discrimination must be exerted here, as when we decide

upon the propriety of healing a perpetual blister, or removing a seton in cases of pulmonary affection. An irritation unconnected with, and independent of the original disease, is here found to relieve, and often to remove its violence. In hesitating with respect to the expediency of healing the seton or the blister, we are not influenced by any apprehension of translating the irritation excited by these agents to the lungs; but we are fearful of checking an artificial morbid process, which it is in our power to increase, or to diminish, according to circumstances, till we judge that the internal irritation is sufficiently allayed. To sum up in a few words, the doctrine with respect to eruptive diseases, which it has been attempted to maintain in the present chapter, it would appear,—First, that it is a mistaken practice to encourage cutaneous eruption.—Secondly, That although by the aid of increased temperature and stimulating medicines, we may excite a miliary eruption, this can neither be considered as salutary, nor critical.—And Thirdly, That a really critical eruption does not appear to be checked, but, on the contrary, in many instances, seems to be matured by reduced temperature.

I shall conclude this section, with a query proposed by the sagacious Heberden, in the Medical Transactions. The remarks which introduce it, afford additional confirmation of the deduction drawn from the curious case already related, under the head of Miliary Fever. “Several patients” says the Doctor, “labouring under eruptive fevers, who have happened to keep out of bed for several days together, have constantly found that the eruption was greater while they were up and cool,* and that it began to fade as soon as they were hot in bed. Is it owing to experience or hypothesis, that eruptions are believed to be thrown out more vigorously by warmth and lying in bed ?”

* We have already seen that cold bathing, far from checking, has promoted the due maturation of the variolous eruption. See p. 84.

CHAP. VI.

OF THE USE OF COLD IN THE HÆMORRHAGIÆ.

SECTION I.

OF ITS USE IN HÆMORRHAGY FROM WOUNDS.

NO arguments need be advanced to prove the propriety of cold applications, in the greater part of the diseases of this order, for daily experience establishes their utility. Dr. Cullen observes, that Cold appears to him to be the most powerful of all astringents, in diseases of this class; and the salutary effects of its general application to the surface, in the form of a cool atmosphere, have been observed by many practical writers. The North American Indians are said to restrain Hæmorrhagy from wounds, by plunging themselves into cold water, and thereby producing a constriction upon the bleeding vessels.*

* Rush on the History of Medicine, among the Indians.

It is probable that the life of many a brave soldier in the armies of the civilized world, who has apparently fallen in the field of battle, has been preserved by the chill of the night air operating in a similar manner.

SECTION II.

OF ITS USE IN HÆMOPTYSIS, AND PHTHISIS.

COLD liquors and cold air have produced the most beneficial effects in Hæmoptysis; and cold water applied to the scrotum, has checked the most violent and distressing cases of it. Dr. Bond,* a celebrated physician in Philadelphia, was much afflicted with this malady. He once immediately checked an alarming attack of it, by undressing himself on a cold day, and wrapping himself up in a sheet dipt in cold vinegar. One immersion in cold water, or a sudden sprinkling all over with cold water, says Dr. Darwin, would probably stop a pulmonary hæmorrhage; for the shortness of breath of those who go into cold water, is not owing to the accumulation of blood in the lungs, but to the quiescence

* The father of his Majesty's Consul General.

of the pulmonary capillaries from association. A further argument for the propriety of cold applications in Hæmoptysis, may be deduced from considering, that heat, as is remarked by various practical writers, is often an exciting cause of this disease.

Without assigning an undue importance to the application of reduced temperature in Phthisis, it may be remarked, that it would probably be found an useful auxiliary in the treatment of this giant malady. Dr. Rush, in his treatise upon this subject, observes, that “ he has repeatedly prescribed walking in a cold air, in the inflammatory stage of consumption, with advantage, and has often had the pleasure of finding a single walk of two or three miles, in a clear, cold day, produce nearly the same diminution of the force and frequency of the pulse, as the loss of six or eight ounces of blood.* Brydone assures us, that he knew an English lady at Nice, who was cured in a short time, of a very threatening consumption, only by a free indulgence in the use of ices.†

* *Inquiries*, Vol. II. p. 125.

† It is, perhaps, to be regretted, that a substance capable of exerting such an extensive agency on the human system, in abating inflamma-

“ I have witnessed the good effects of cold bathing in Phthisis,” says Mr. Grose, “ when every other remedy had failed. By bathing the

tion, and which might therefore be regarded, upon many occasions, as a valuable article of the *Materia Medica*, should have been added to the list of those luxuries which grace our tables. Iced liquors are most gratifying, when the body is exposed to the heat of a crowded room, and are often most injudiciously introduced as a refreshment, after the heat and fatigue occasioned by dancing. That under these circumstances they should prove detrimental to the system, might naturally be expected. But even when the body is perfectly cool, the effects of the introduction of aliment so much below the temperature of the body, may be highly noxious. Dr. Haller informs us, that the cold water which he drank whilst crossing the Alps, which is entirely furnished by the solution of those immense masses of ice which cover their summits, produced a pain in his breast resembling pleurisy; also a singular stupor, a dejection of mind, and a disinclination to any kind of exertion.

Dr. Rush relates the cases of two officers in the American army, one of whom, from imprudently eating a quantity of ice-cream, was afflicted with a scirrhus in the stomach, which terminated fatally, at the distance of twelve months: and the other was attacked by a disease so acute as seriously to endanger his life, from imprudently taking a large draught of iced punch.

The suppression of the menstrual discharge has also been enumerated amongst the effects produced by the use of ices: an effect of this kind becomes probable in proportion to the delicacy of the subject. The annals of the Clinical Institute at Wurtzbourg, contain the history of a young woman, of a very feeble constitution, in whom the regularity of this important function had been with difficulty established by medical aid. In the summer of the year 1796, she drank, when warm, a large quantity of cold water. The discharge ceased, and never afterwards returned, although the most active emmenagogues were made use of. Some months afterwards, her health rapidly declined—a great difficulty of breathing came on, and she died at the end of about two years, of a polypus of the heart. (*Bibliothèque Germanique*, Tom. VII. p. 24.—See also Tissot; *Avis au Peuple*.) In the last work, the author informs us, that a pleurisy so violent as to destroy life in a few hours, has been sometimes produced by drinking cold water, when the body is much heated. Instant death is not an unfrequent consequence of similar imprudence, in the burning summers of the United States.—*Consult Zoonomia*, Vol. I. Sect. 33.

chest, morning and evening, with cold water, the frequency of the cough has lessened, the tongue has kept moist, and the patient has experienced from its use, the most grateful sensations." Such applications would, of course, be adviseable only when the febrile heat, or arterial action, exceeded the limits of health : and great care should be taken to avoid any subsequent exposure to heat, which might excite additional disturbance in the system, by acting upon accumulated excitability.

SECTION III.

OF ITS USE IN EPISTAXIS, HÆMORRHAGIA RENUM, AND
HÆMORRHAGIA UTERINA.

COMMON experience establishes the benefit derived from cold applications in Epistaxis.* They are especially serviceable when applied to the neck : or the head may be immersed in spring water, and its natural coldness increased by dissolving common salt in it.† A case is related by Dr. Rogers, in which a most alarm-

* See Zoonomia, Vol. I. Sect. 27.—Vol. II. p. 17.

† In epistaxe, remedium apud omnes notissimum, est aqua frigida, quæ ope lintei, fronti vel nuchæ imponitur : nec ullum quidem efficacius invenitur.—*Tucker, Dissert. Med. Inaug.*

ing Hæmorrhagy of this kind, which had lasted several hours, and resisted all the common applications, was arrested by the application of ice to the chest, abdomen, and vagina. The discharge was diminished in a few minutes. Instead of flowing, as at first, in a full stream, it began to escape by drops, and in a few hours ceased entirely, the ice being occasionally renewed till a cessation had taken place.*

When Hæmorrhagy takes place from the kidneys, Dr. Darwin recommends cold immersion up to the loins, the upper part of the body being covered; and gives an interesting case where this plan had succeeded, after venæsections, mucilages, balsams, preparations of lead, the bark, alum and dragon's blood, opiates, and a large blister on the loins, had been separately tried in large doses to no purpose. The hæmorrhagy diminished at the first, and ceased at the second immersion.

In uterine hæmorrhagy, whether occurring in a state of pregnancy or otherwise; as also, in cases of it succeeding parturition, cold has been

* Medical and Physical Journal, Vol. VI. p. 110.

successfully applied in a great variety of forms. When it occurs under the circumstances last mentioned, Mr. White recommends, that linen cloths, or a sponge dipt in cold vinegar or water, should be frequently applied to the lower part of the abdomen, and to the loins; or, what is still more effectual, an ox's bladder half filled with cold water, may be applied to the fore part of the abdomen, the patient at the same time lying on her back; which, by its coldness, and likewise by its pressure on the uterus, helps it to contract.* Dr. Darwin recommends, in similar cases, the external application of cloths dipt in cold vinegar.† But cold water has not only been applied externally; it has also been successfully injected into the uterus, by Dr. Gordon, of Copenhagen, in several cases of profuse flooding. Both the internal and external use of the same remedy, were sanctioned by the late celebrated professor of midwifery in Edinburgh, Dr. Young. Levret

* Management of Lying-in-Women, p. 139.

† “It has been a tried experiment for women,” says Sir John Floyer, “to put their feet into cold water, in their Hæmorrhagies from the uterus.” That an imprudence of this kind, or even a sudden chill applied to the feet, will suddenly arrest the flow of the catamenia, is a fact of almost daily experience.

introduced a bit of ice into the uterus, with the same indication, and with equal success.*

SECTION IV.

OF ITS USE IN HÆMORRHOIDS.

IN cases of Hæmorrhoidal affection, when the heat and irritation are considerable, great relief has been obtained from repeated applications of cold water to the part affected; but this remedy is more particularly valuable as a preventative of this distressing affection. The daily use of cold ablution has obviated, for a considerable time, the recurrence of the disease, in patients habitually disposed to it.†

Professor Hildebrand, in his treatise on this complaint, earnestly recommends the use of cold water in the form of enema, after the cessation of an attack of bleeding piles. It is always necessary in such cases, he observes,

* Aitken's Elements, Vol. I. p. 268.

† The distressing pain in the rectum, which often attends persons affected with a gouty diathesis, readily yields to the same remedy. Dr. Rush particularly notices this symptom; and observes, that "cold water applied to the part, generally gives immediate relief."—*Medical Inquiries*, Vol. v. p. 188.

to restore the tone of the veins of the large intestines ; and nothing is more advantageous with this view, than cold injections. In his hands, this practice has never been attended with any disagreeable consequence, except in the case of one person, whose nerves were exceedingly irritable. This patient, after submitting to the administration of some injections of this kind, had violent spasms in the intestines, in consequence of which, their exhibition was desisted from. Cold solutions of alum, and of sulphate of iron, are, he observes, still more efficacious than cold water, but they are too irritating to admit of their being daily made use of.

The plan generally pursued by the professor, was to begin by administering an injection of cold water to the patient once a day only ; and if he bore it well, to give one morning and evening. The temperature of the water should be sufficiently low, to produce in the intestinal canal, a marked sensation of cold ; but it ought to be a little tempered at first, especially if the patient be of an irritable frame.

Injectons of this nature must be abstained from, while there exists an actual discharge ; and they must be used with caution, if the patient be plethoric, or disposed to apoplexy ; in the last case, bleeding should precede their exhibition. With these precautions, the use of cold in this form is recommended as one of the best remedies to resort to, whenever the disposition to hæmorrhoids, is accompanied by general debility ; either in the intestinal canal, or in the whole body.*

* *Bibliothèque Germanique. Tom. I. p. 168.*

CHAP. VII.

OF THE USE OF COLD IN THE PROFLUVIA.

HAVING already treated of the use of cold in Catarrh, under another head, it only remains, in pursuance of the plan which has been laid down, to consider its use in dysentery. It has been recommended to wash the belly with cold water in this disease. Motions are thus excited, by which any obstructions are removed,* and the inflammatory and erysipelatous state of the bowels, together with the topical sensibility of the affected parts, are, in a great measure, diminished. Several of Dr. Currie's correspondents in the Second Volume of his Reports, speak of the successful exhibition of the cold

* See hereafter the Section on Colick.

affusion, in cases where diarrhœa or dysentery were present : and Dr. Lind mentions the cold affusion, as a cure for the chronic dysentery of warm climates. It has also been recommended for the purposes of external cleanliness, (an article of acknowledged importance in the treatment of this disease,) as well as with a view to the promotion of a diaphoresis.*

Cold water is also said to have produced beneficial effects in an epidemic dysentery, by being used as a beverage. Frequently when opiates and antimonials were administered without advantage, repeated draughts of cold water diminished the pains.†

Dr. Michael Rosa, an Italian physician of much celebrity, informs us, that he exhibited clysters of cold spring water, to an Italian gentleman who laboured under a most violent dysentery, attended with the most excruciating pain. An immediate relief was obtained, but such a chill was given to the body of the patient,

* New-York Medical Repository, Vol. I. p. 239.

† Medical and Physical Journal, Vol. V. p. 490.

that his teeth chattered with the cold. After enduring this application for a little time, he became impatient, and refused to have it administered for two days; in consequence of which his complaint returned with redoubled violence, but again left him upon the renewal of the cold clysters; and upon persisting in their use, a speedy cure was obtained.*

* *Osservazioni sopra alcune Malattie particolari*, p. 133.

CHAP. VIII.

OF THE USE OF COLD IN THE COMATA.

SECTION I.

OF ITS USE IN SANGUINEOUS APOPLEXY, AND INTERNAL DROPSY OF THE BRAIN.

IN apoplexy, the free admission of cool air, and cold applications to the head, have been much recommended by almost all practical writers. “ One of the most effectual methods of rousing apoplectics,” says Dr. Cullen, “ seems to be throwing cold water on several parts of the body, or washing the body all over with it.*

In Apoplexia Hydrocephalica, Dr. Rush applied vinegar, in which ice had been dissolved, to the head, with evident advantage. He found

* First Lines, Sect. 1131,—1139.

that linen cloths wetted with cold vinegar and water, and constantly applied to the forehead, contributed very much to relieve the acute pain in the head which generally accompanies this disease.* This mode of relieving or diminishing the excessive action in the head which always accompanies the early stage of Hydrocephalus, has, I believe, been seldom resorted to, in Great Britain; although it would most probably, especially in this period of it, be found a valuable auxiliary, in encountering a melancholy, and too often fatal, affection.

SECTION II.

OF ITS USE IN THE APOPLEXY INDUCED BY INTOXICATION,
CARBONIC ACID, GAS AND INSOLATION.

THE apoplexy which sometimes succeeds excessive drinking, (*Apoplexia Temulenta of Sauvages*,) might probably be effectually prevented by the use of cold applications. Indeed this practice is occasionally resorted to by the votaries of Bacchus, as has already been observed in

* *Inquiries*, Vol. II.

a former part of this essay. There is some interesting information on this head contained in Dr. Trotter's excellent Essay on Drunkenness ; and Dr. Currie has given us one of the most curious cases which the records of medicine, on this subject, can furnish.* He relates the history of a gentleman in the West Indies, who was in the habit of almost daily intoxication ; and who, under these circumstances, regularly undrest himself, and immersed his whole body, up to the neck, in a trough, which he had provided for the purpose, filled with cold water. In this situation, he was accustomed to compose himself to sleep, and was roused by the drawing off of the water, which was done by his family as soon as he was supposed to have slept himself sober. This practice he persisted in for many years, without apparent injury ; and the effects of his habitual excess appeared to be obviated to a considerable extent by this refrigerating process. He, at length, however, died apoplectic.

The effects of Cold in relieving a fit of intoxication, are exactly similar to those produced by other sedatives in the same circumstances ; and

* See the third edition of his Reports, Vol. I.

- its dangerous, or even fatal agency, when used in what is called by Dr. Trotter, its *secondary* state, exhibits further proof of its mode of operation. In the case related by Dr. Currie, it is highly probable, that if the attention of the family of the inebriate had not removed the cold bath, as soon as it had effected its salutary process, and cooled the drunken fever, the subject of it would not have survived, to make many repetitions of his experiment.

The contemplation of these two stages of drunkenness, suggests the recollection of a difficulty in the Brunonian system, which has often impressed my mind ; and which, as its investigation may not prove altogether irrelevant, in illustrating the mode of action of our remedy, I shall beg leave to lay before the reader. “ Indirect debility” says Dr. Brown, “ is the effect of excess of stimulation.” The instance which he himself furnishes, as a convenient example of this state, is that caused by excess in spirituous potation. This indirect debility he considers as established, on the morning succeeding the debauch : and his curative plan consists in the gradual administration of something less of

the stimulus which originally produced it, till the system be raised to the state of healthy excitement. But if the system, in the morning after a debauch, be labouring under indirect debility, what name shall we give to that induced on the evening of the excess? For instance: the inebriate is perhaps only moderately excited by a pint of wine; he proceeds to a bottle and is intoxicated: he continues his potation: the organs of sense and motion at length lose all power, and he falls asleep, or sinks in a state of insensibility to the floor. What is the proper designation of this state; is not this indirect debility also? but would it be proper, or justifiable in this state, to administer stimuli a little inferior in power to those which originally produced the morbid state? On the contrary, we endeavour in this stage of indirect debility, to subduct the stimulus with as much rapidity as possible; and whether we excite the overcharged stomach to relieve itself of its contents, or bathe the head with cold water, we pursue, although by varied means, the same indication. But if the patient be left without these means of relief till the morning, we find him in a situation widely different: the application of cold,

becomes then peculiarly distressing; the stomach requires the introduction of cordial aliment, and the body demands the stimulus of external warmth. Should not a different name be given to two states of the system, differing so widely, and requiring such different remedies? yet, assuredly the Brunonian definition of indirect debility includes the former of these states, as well as the latter.*

Might they not be distinguished by the names of *primary* and *secondary*, indirect debility? The difference between them is well illustrated by two instances, given by Dr. Trotter, in which the results exactly correspond with the tenor of the above observations. A miller, returning home drunk from market, slipt, by accident, into his mill-dam, and continued in it for a considerable time, often immersed to the middle, before he could contrive to extri-

* What are the phenomena of peripneumonia notha, or of sanguineous apoplexy? Unquestionably, the system, in both these diseases, labours under a state which is included in the above definition; but should we venture to stimulate in these diseases, what would be the result? In all probability, speedy and complete disorganization. It is true, that a few of the more ardent disciples of this truly illustrious medical philosopher have pursued these principles to their full extent; but I apprehend that their success, with a very few exceptions, will not be found to justify the general adoption of a similar practice.

cate himself; by the time that he effected this, he was perfectly sober, and no inconvenience followed the accident. On the other hand, a gentleman who attempted to relieve the secondary stage of indirect debility, by the application of cold to the head, produced an affection of that part, which soon proved fatal.*

The efficacy of cold affusion in that modification of *apoplexia venenata*, which is induced by the fumes of charcoal, has been adverted to,

* Similar rules apply to the treatment of the disease induced by the stimulus of a large dose of opium. In an early stage, the apoplectic sleep and stupor which occur, must be relieved by depleting remedies. The author well remembers a case which occurred, while he was a student of medicine, which was strikingly illustrative of this rule. An unfortunate female, while in a carriage with a friend swallowed an ounce of laudanum. The action was observed, and she was conveyed by her terrified companion, in about half an hour afterwards, to the door of the practitioner, under whom the author then studied. She was taken out in a state nearly insensible. Ten grains of vitriolated zinc were instantly administered without effect; ten more were added, in a few minutes afterwards; and other means were, in vain, resorted to, to excite the action of vomiting. As the comatose symptoms continued evidently to increase, a vein was opened, and nearly twenty ounces of blood taken away; sense and motion immediately began to return; the emetic action of the zinc was produced, and the patient was left in a short time afterwards, with no other remaining symptom of the danger she had escaped, than a little languor. But had such a practice been adopted at a later period; when, for instance, the primary stage of indirect debility had passed; it would have only accelerated a fatal catastrophe; for this stage of the affection would require the administration of the most cordial stimuli. This subject might be further pursued; but, perhaps, the present discussion has already exceeded its just limits.

in the first chapter of this work. The following extracts afford abundant proof, both of the close analogy which the suffocation thus induced bears to apoplexy, and of the powerful agency of this valuable remedy. They are taken from the Inaugural Essay of Dr. Johnson, from which a quotation has already been made.

“ March 7th, having destroyed a cat by introducing it under water into a bell-glass filled with carbonic acid gas, procured from powdered marble and diluted vitriolic acid, it was withdrawn after being exposed 3 minutes, and 1 minute after it had ceased to show signs of life. In 3 minutes after the application of the ice, its heart began to beat; cold water was now constantly thrown over it, its respiration became evident and constant, and in 5 minutes it made an attempt to rise. The pupils of the eyes which had been greatly dilated, now contracted to nearly their former size, and the body became exceedingly hot; the cold water continued to be thrown over it, till it ran about freely.

“ Dr. Bache informed me, that in one case,
 “ he restored life to a cat that had been con-
 “ fined in carbonic acid for the space of 15 mi-
 “ nutes; 12 at least, after life had, to all appear-
 “ ance, ceased, by the application of cold water,
 “ it being frequently dashed over the body.

“ Dr. B. Duffield, of Philadelphia, has oblig-
 “ ed me with the history of a case of asphyxia
 “ from the same cause, in which the treatment
 “ here recommended, was proved in the clearest
 “ light possible, to be completely successful.—
 “ A young man, 18 years of age, by name Isaac
 “ Turner, being healthy and robust, was pre-
 “ vailed on by the promise of six dollars, to at-
 “ tempt the recovery of a watch, belonging to
 “ a French gentleman, which had fallen into an
 “ old, confined, and filthy necessary. He de-
 “ scended by a rope fixed round his body, and
 “ instantly sank to his waist in the filth below.
 “ He then stooped and began to stir about, and
 “ grope for the watch; by which motion it is
 “ probable he disengaged a large quantity of the
 “ noxious vapour, by disturbing its retaining
 “ cause, and by his position inhaled a larger

“ quantity of it than he would have done if
 “ erect. He informed me after recovery, that
 “ he had not stirred the filth more, as he ima-
 “ gines, than one minute, when (to use his own
 “ words) his head began to turn round, his sto-
 “ mach to be so sick as nearly to cause fainting ;
 “ and his breast seemed to be buckled round
 “ with a broad strap, so as to prevent his breath-
 “ ing. In this situation he called with a hoarse
 “ voice to his assistants above, ‘ for God’s sake !
 “ hoist me out ;’ but they ignorant of his situ-
 “ ation, neglected him, as an intelligent man
 “ present supposed, for the space of 5 minutes,
 “ when finding the rope much tightened, and
 “ not moved, they drew him up covered with
 “ filth, pale, and apparently dead. He was car-
 “ ried to his master’s house, and I saw him in
 “ about the space of 5 minutes more. Being
 “ stripped, (which was easily done, as he was
 “ remarkably limber and flaccid, no appearance
 “ of life remaining but the natural warmth) I
 “ ordered two men to stand with buckets, and
 “ dash water over him constantly as he lay on
 “ the floor, the one over his head and body, and
 “ the other over his extremities, and the water
 “ to be constantly supplied fresh as it was used.

“ In a few minutes he was in a cold bath com-
 “ pletely, for the floor was inundated with wa-
 “ ter; the windows had previously been opened;
 “ the water continued to be dashed cold over
 “ his body, and in 20 minutes the heart seemed
 “ to resume its functions; in 30, a feeble pulse
 “ was observed in his right arm. Shortly after
 “ he opened his eyes, and in the course of half
 “ an hour more his speech returned; his pulse
 “ had now increased rapidly, and he begging to
 “ be let alone, the dashing of water was discon-
 “ tinued one hour after it first begun. In 3
 “ hours after I saw him again; his face was
 “ turgid, his eyes inflamed, his head dizzy, and
 “ his mind confused, with a pulse so full and
 “ strong, as to demand copious venæsection and
 “ a strong cathartic of calomel and jalap. The
 “ blood was buffy, and had a smaller proportion
 “ of serum than natural. The next day he
 “ looked as spiritless, feeble, and languid, as if
 “ he had just recovered from a severe and tedi-
 “ ous illness—he was not able to return to
 “ work until after 21 days.”

“ The air to which this young man was ex-
 “ posed, was probably a combination of alkaline

“ gas from the fæces, and carbonic acid, disen-
 “ gaged by the fermenting matters. This mix-
 “ ture, if such it was, has been proved by an
 “ experiment of M. Troja, to have an effect
 “ precisely similar to that of pure carbonic acid;*
 “ the happy recovery was undoubtedly owing
 “ to the application of cold water, so judici-
 “ ously continued for that great length of time.
 “ When life was restored by this treatment, it
 “ is probable that the patient would again have
 “ sunk under the violent action of the arterial
 “ system, had it not been reduced by the liberal
 “ evacuations and other treatment of fever.”

“ The application of cold, and of cold water,
 “ which when long applied, has proved so bene-
 “ ficial in cases of this kind, is a remedy to
 “ which we are familiar in similar affections.
 “ Children, and the common people, use this
 “ method of relieving persons who are found in
 “ that species of apoplexy, which is known to
 “ be induced by the immoderate use of spiritu-
 “ ous liquors, and which occasionally proceeds
 “ to such lengths, as to be with difficulty dis-
 “ tinguished from the true state. Ask them

* See Rosier, p. 182.

“ why they pump on, or pour cold water over
 “ persons thus affected, and they will tell you,
 “ to make them sober ; that is, to reduce the
 “ excessive determination of arterial action to
 “ the brain, and thus permit the mind to re-
 “ sume its supreme dictatorial function, and the
 “ nervous system its important office in the
 “ animal œconomy.”

“ The Russians, and inhabitants of Siberia,
 “ we are told, have frequent occasion for assist-
 “ ance in cases of this kind, where charcoal
 “ fires are so largely employed. They drag
 “ persons motionless, and apparently dead, from
 “ the place in which they were exposed, and
 “ rub them with snow or ice, or dash cold wa-
 “ ter repeatedly over the whole surface of the
 “ body. This method, we are informed, is uni-
 “ versally practised among the common people,
 “ and with constant success, where respiration
 “ has not been suspended more than an hour.”*

“ When ice cannot be procured, may not a
 “ refrigerating mixture by the solution of neu-

* See Dr. Fothergill's Dissertation on the Suspension of Vital Action,
 page 136.

“ tral salts, be applied in bladders, so as effec-
 “ tually to answer every purpose? When nei-
 “ ther this, nor ice, nor even water in sufficient
 “ quantities can be procured, let us not cease
 “ to exert ourselves in that most admirable, but
 “ too frequently least successful of all pursuits,
 “ the restoration of life. Let us throw on what
 “ water we can get, and expose the patient to a
 “ current of air, that the body being thus moist-
 “ ened, may be reduced in temperature by the
 “ evaporation: if not water, throw on spirits,
 “ alcohol, æther, or any other fluid, which, by
 “ a speedy evaporation, may produce the neces-
 “ sary degree of cold.”

“ Seeing this treatment so effectual as we
 “ are promised it will be, we may well be sur-
 “ prised that it has not been more commonly
 “ practised in relieving the different cases of
 “ apoplexy, in which little has been done except
 “ the liberal application of the lancet. Apo-
 “ plexy, it is true, is not constantly relieved by
 “ these remedies. I am disposed to believe,
 “ however, that apoplexy, as well in ordinary
 “ cases, as from exposure to carbonic acid, &c.
 “ may be always relieved, when the asphyxia is

“ induced by congestion of blood in the brain,
 “ or by the distention of the vessels without the
 “ effusion of their contents ; provided these re-
 “ medies be persevered in a sufficient length of
 “ time : when effusion has taken place, the
 “ success is very doubtful. In one case of a
 “ puppy, where I failed of restoring life (perhaps
 “ by not continuing the cold long enough) I
 “ found, on dissecting the head, not only the
 “ blood-vessels all greatly distended, but like-
 “ wise a quantity of red blood effused on the
 “ back part of the brain, between the dura and
 “ pia mater,”

I must apologize for the length of this extract, by observing, that the facts detailed, appear to me highly interesting ; and that the work from which they are taken, having never been published, its circulation has been hitherto confined to the Medical friends and instructors of the ingenious author.

Mrs. Piozzi relates the immediate recovery of a man employed in a large brewery, who had fallen senseless to the bottom of a vat which he had imprudently entered, before the carbonic

acid gas had been removed, by plunging him over head and ears in the cooler. So sudden was his restoration, that "it was difficult," says the authoress, "to impress so insensible a mortal, with a due sense of the danger which his rashness had incurred.*

Tissot records two instances of *Carus ab Inso-latione*, or, as it is vulgarly called, a stroke of the Sun, in which the good effects resulting from the application of cold water, were particularly evident. The first is the history of a man who having been for a long time exposed to the scorching rays of the sun, became highly delirious, though without fever, and proved really mad. After repeated bleeding, he was thrown into a cold bath. This was frequently repeated, and cold water at the same time poured upon his head. By this mode of treatment, he recovered.

The second, is the case of an officer, who having rode post for several days successively, in very hot weather, swooned away immediately upon dismounting at the end of his journey ;

* Journey through France, Italy, and Germany, Vol. II. p. 34.

nor could he be recovered by the usual applications in such cases. He was cured however at last, in consequence of being plunged into a bath of freezing water.

SECTION III.

OF ITS USE IN PARALYSIS.

THE diminished vital energy in Paralysis, would, probably, contraindicate in most instances, the use of cold applications; but Dr. Darwin has suggested a mode, in which they might prove beneficial. "There is reason to believe," he remarks, "that the exposing a paralytic limb to cold, for a certain time, as by covering it with snow, or iced water, for a few minutes, and then covering it with warm flannel, and this frequently repeated, might, by accumulation of sensorial power, contribute to restore it to a state of voluntary excitability."*

* *Zoonomia*, Vol. II. p. 391.

CHAP. IX.

 OF THE USE OF COLD IN THE SPASMI.

SECTION I.

 OF ITS USE IN TETANUS.

THE remedy which is the subject of these pages, has been extensively and beneficially employed in diseases belonging to the order of the Spasmi. In Tetanus, the affusion of cold water is esteemed by Dr. Moseley, by far, the most efficacious remedy: he recommends that the patient should either be immersed for some minutes in a tub of cold water every two hours; or that he should be placed upon the floor, and from two to eight or ten pails-full of the coldest water be suddenly poured upon him. In the West-Indies, where this is unhappily a disease of frequent occurrence, this remedy obtains almost universally. A Dutch practitioner

in the island of Nevis, cured one patient by laying him in wet sheets ; but was obliged, for fear of the ill consequences attending a deviation from established customs, to relinquish this mode of treating the disease.*

Cases might easily be multiplied to prove the beneficial effects resulting both from cold immersion, and the cold affusion. Dr. Currie has related several that are particularly valuable. A highly interesting one is also given in the Fourth Volume of the Medical and Physical Journal, p. 288 ; in which the natural coldness of the water was increased by dissolving ice in it, in proportion as the patient became habituated to its influence. Dr. Rush employed it with perfect success in a case which had resisted all the common modes of treatment, and to which he was not called till the third day. The patient was a female, and was enduring the most exquisite suffering, when the Doctor ordered several buckets of cold water to be dashed over her. The muscles of the jaw instantly relaxed, and she fainted from the shock ; but was soon recovered by the administration of the

* Medical Commentaries, Vol. III.

usual remedies in such cases, and had no return of the disease.

The following case was treated by a fellow student of the author, and is transcribed with the less reluctance, as it is contained in a work less generally known to the Medical Profession in this country, than its merits deserve.

“ In the autumn of 1799,” says the reporter, “ I visited a labourer, about thirty years of age, of a slender make, but healthy ; who was suddenly seized, whilst in bed, with spasms in his lower extremities, which shortly afterwards affected his whole system, but particularly his stomach, which was drawn into a hard lump, and protruded to a considerable distance. His pains were excruciating; he had a violent vomiting and purging, which came on an hour after the seizure, and continued about two hours. At one time he had emprosthotonos, at another opisthotonos to the greatest degree, and sometimes, complete tetanus. The muscles of his face were drawn in every direction, and deglutition entirely impeded. His pulse varied much, but was generally feeble. He could assign no

cause for the attack ; I bled him, put him in the warm bath, and used all the remedies laid down by Medical writers, but without any mitigation of his pains, or relief to his spasms.

“ At this time, which was twenty hours after the attack, when the cold sweat of death appeared to be upon him, his tongue had refused its office ; his eyes sunk, having a glassy appearance, and his exit was every moment expected ; it occurred to me, that the cold bath might have a good effect ; and after consulting his friends, who readily acquiesced, I had him, in this state, carried in a blanket, to a mill-dam, which was at hand, and plunged in. He was then insensible, his spasms immediately abated, and in twenty minutes totally ceased. The debility induced by muscular exertion was such, that it required several days before he could be removed, after which he rapidly recovered, and is at this time perfectly well.”*

* New-York Medical Repository, Vol. IV. p. 76.

SECTION II.

OF ITS USE IN CONVULSIO, CHOREA, ASTHMA, AND EPILEPSIA.

MUCH advantage has been derived from exposing children labouring under the convulsions which sometimes accompany hooping-cough, and the eruptive fever of small-pox, to a stream of cold air. In the application of cold as a remedy for convulsive diseases in general, Dr. Currie inculcates the propriety of its being made use of when the convulsion is present,—a rule which I believe will be found to be important; for he remarks, that in spasmodic diseases which do not arise to general convulsion, as for instance, in Chorea Sancti Viti, he has used it frequently, but without benefit.*

The sufferer in spasmodic asthma, is directed by an instinct of nature, to seek the cold air in the paroxysms of his disease. Dr. Darwin attributes the relief derived from this practice, to the greater quantity of oxygen contained in a colder volume of air than that of the chamber

* Dr. Baynard, however, relates two instances of the cure of this affection by cold water.

of the sufferer. But an analogy deduced from the relief experienced in other convulsive diseases, where cold can scarcely be supposed to act in this way, might lead to an opposite conclusion. It must be confessed that the analogy might mislead, since Dr. Currie observes, that he has not found cold affusion beneficial in Epilepsy; but the remedy deserves a further trial, both in the former and the latter disease.*

SECTION III.

OF ITS USE IN COLIC, CHOLERA, AND HYSTERIA.

IN Colic, Dr. Rush informs us, that he has given clysters of cold water, with immediate relief. One of his patients in particular, who was often afflicted with it, derived such benefit from their use, that she used an injection of this kind, whenever she had an attack of it. Dr. Cullen observes, that when every purgative has failed in this disease, the action of the intestines has been effectually excited by throwing cold water on the extremities. An instance of this kind,

* A case of Epilepsy, in which the affusion appears to have been attended with beneficial effects, will be given in the Appendix.

is related by Dr. Stevenson in the sixth volume of the Edinburgh Medical Essays. The constipation of the bowels was obstinate; it was attended with extreme pain, considerable fever, and apparently imminent danger. The cure was chiefly effected by dashing cold water upon the lower extremities, up as high as the *pubes*, and plunging the feet into cold water after the warm bath had failed.

The great father of medicine records a case of Colick, attended with most obstinate constipation, in which the sufferings of the patient were so acute as to cause her to faint five times successively: and so complete was the suspension of her vital powers, that she was supposed by her attendants to have expired. Under these circumstances, thirty *amphoræ* of cold water were dashed over her. The application was followed by a plentiful discharge of bile, and the patient recovered.*

* Hippocrates, Edit. Vander Linden, Tom. I. p. 782.

The intimate sympathy between the skin and the inner surface of the intestinal canal, will account for this phenomenon, and leads to many important practical consequences. To this sympathy we must also refer the great utility of blisters in dysentery, and other disorders of the alimentary canal.

In Ileus, Dr. Darwin recommends a clyster of ice water, and again suggests its use in his *Materia Medica*, under the head of *Revertentia*. Perhaps this powerful application would scarcely be necessary except in cases where active inflammation existed; in general I should imagine that cold affusion on the surface would be found more simple, and equally effectual.

Dr. Cleghorn* informs us, that he has been often assured by the Spanish physicians that they have found nothing more beneficial in violent and deplorable Choleras, than drinking cold water. The use of cold drink is recommended in the same diseases by Aretæus, as an useful remedy to restrain the retrograde course of the humours, and to cool the burning stomach.

In Cholera Infantum, a most distressing and frequently fatal disease in warm climates, Dr. Rush observes that he has had but few opportunities of trying the effects of cold water applied to the body: but from the benefit which attended its use in the cases in which it was per-

* Diseases of Minorca.

mitted, he is disposed to believe, that it would do great service, if the prejudices which exist in the minds of parents against it, could be overcome.*

So remarkable are the effects of reduced temperature in this disease, that it has been remarked, that a cold day very frequently abates its violence, and disposes it at once to a favourable termination. A writer on this subject, in the *New York Medical Repository*, has the following observation. “ It would be improper here to pass without notice, the efficacy of cold water, or iced water, as the severity of the case may require, injected into the bowels. This operates powerfully as an anodyne, sedative, and antispasmodic.” Independently of actual experience, a striking analogy in favour of this remedy, is presented by the instantaneous relief it affords, in the retrograde motions of the alimentary canal, which take place in *Hysteria*, the next disease in this order, which claims our attention.

Dr. Currie observes that in the *Hysteric Paroxysm*, the cold bath, or indeed the plentiful

affusion of cold water, is an infallible remedy : and the cold or iced clysters above-mentioned, according to Mr. Pommé, relieve the inverted motions of the intestinal canal which occur in this disease, like a charm. “ Perhaps,” says Dr. Darwin “ they are checked by the torpor occasioned by cold ; or one end of the intestinal canal may become strengthened, and regain its peristaltic motion by reverse sympathy, when the other end is rendered torpid by ice-water.”* The reader who is disposed to pursue this subject further, will meet with some interesting remarks in the second volume of the Memoirs of the Medical Society of London, which prove that the use of cold water in complaints of the bowels, is of a very early date.

SECTION IV.

OF ITS USE IN HYDROPHOBIA.

THE last genus in this class is the Hydrophobia, a disease almost unrivalled in horror and fatality. Dr. Rush, in his Essay on this subject,

* Zoonomia, Vol. II. p. 157.

has adduced a variety of forcible arguments and analogies to prove that this disease should be considered as a malignant state of fever. Of the arguments adduced in support of this opinion, a slight sketch is given in the second volume of the Medical and Physical Journal. If this analogy be just, we have strong reason to believe that the administration of cold in various forms, and pursued to a great extent, might be found beneficial in this hopeless disease; as we have already traced its salutary agency, in some of the most malignant febrile distempers.

The use of cold water in Hydrophobia has the sanction of high antiquity. Celsus recommends that the patient should be suddenly thrown into a pond, and if he cannot swim, that he be left there till he be almost drowned. Sometimes raising him to the surface, at others keeping him under, and thus compelling him to swallow a quantity of cold water.*

* Celsus, Lib. V. Cap. 27, Sect. 2.

In the eleventh volume of the Medical and Physical Journal, some ingenious hints and speculations are thrown out, in which a similar practice is adverted to, but the author recommends that the immersion should be continued till the vital powers appeared to be actually extinguished, and that the usual means of restoring suspended animation

Some facts relative to the operation of cold water in this disease, may be seen in Southwell's Medical Essays.* Amongst others, he gives us the history of a case which was delivered to the Academy of Sciences. The patient was tied to a tree, and while in this situation had two hundred buckets of water poured upon him : he recovered without any other assistance.

should then be resorted to. It is worthy of remark, that Dr. Mead records on the authority of Van Helmont, two instances in which this plan had been successfully adopted. One was a case of Mania, the other of Hydrophobia.—See Mead's Works, 4to. Edition, p. 92.

* Vol. II. p. 94.

CHAP. X.

OF THE USE OF COLD IN THE VESANIÆ.

SECTION I.

OF ITS USE IN AMENTIA AND MELANCHOLIA.

IT would be easy to cite a great variety of authorities, in support of the free application of Cold in diseases of this class. Upon principles similar to those upon which Dr. Darwin recommends its administration in Paralysis, it may often be found advantageous in accumulating excitability, and thus diminishing the torpor of the system, in Melancholia. With this view Mons. Pommé recommends that some melancholy patients should be kept from two to six hours in spring water, and in baths still colder. The author had an opportunity of witnessing a most extraordinary instance, of the good effects of a practice founded upon this principle of creating an artificial excitability, in a case of Amentia,

which occurred in the Pennsylvania Hospital, under the care of Dr. Rush. In this instance, the fatuity was so complete, that the unhappy patient if placed at the top of a stair-case, would advance unconsciously as if on a plane surface, and fall to the bottom. The alternate action of very hot and cold baths, of a shower bath falling from the top to the bottom, of a lofty building,* and a salivation, so far restored the mental functions, that he became capable of giving rational answers to familiar questions, and of assisting in the business of the hospital.

* The shower-bath here alluded to, was capable, in all cases, of producing very striking and powerful effects. It was constructed under the direction of Dr. Rush. In a wing of the hospital, particularly appropriated to the reception of insane patients, a space, about three feet square, was left in the flooring of the galleries communicating with the cells on each story. This space was occupied by a strong wooden lattice, or grating, divided into spaces of about an inch square. As these lattices were placed in an exactly perpendicular direction, one over the other, it was easy for the medical attendant to subject the patient to any degree of impression required, by directing the water to be thrown from the height of one, two, or three stories. Dr. Cox, in his ingenious *Practical Essay on Insanity*, remarks that a practice something similar has been employed with much advantage by the French physicians; but it does not appear to have been much tried in this country. The effect in these cases is, perhaps, to a considerable extent, mechanical.

SECTION II.

OF ITS USE IN MANIA.

ARETÆUS in his chapter *De curatione Phreneticorum*, recommends the affusion of cold water. Dr. Cullen observes that “maniacs have often been relieved, and sometimes entirely cured, by the use of cold-bathing, especially when administered in a certain manner. This seems to consist in throwing the madman into cold water by surprise; by detaining him in it for some length of time; and pouring water frequently upon the head, while the whole of the body, except the head, is immersed in the water; and thus managing the whole process, so as that with the assistance of some fear, a refrigerant effect may be produced.* This I can affirm, has been often useful; and that the external application of cold may

* The following case is related by Dr. Baynard. “A man was so raving mad, that he was bound in fetters. Having first tried all evacuations usual in such cases, together with opiates in great quantity, but to no purpose, I at length plunged him *ex improviso* into a great vessel of cold water, and at the same time, threw on him, with great violence, ten or twelve pails full of cold water on his head: but that not succeeding, the next day, having the conveniency of a fall of water about half a mile off, I caused him to be placed in a cart, and stripped of his cloaths; and being blindfold, that the surprise might be the greater, let fall on a sudden, a great fall or rush of water, about twenty

be of service, we know further from the benefit which has been received, in some maniacal cases, from the application of ice and snow to the bare head, and from the application of the clay-cap.”*

Dr. Brown maintains the same opinion, and advises that the patient should be immersed in water as cold as possible, and kept under it, covered all over for a long time, till he is almost killed.† Perhaps however every effect desired, might be produced without keeping the head of the patient under water, and thus endangering suffocation, by constant applications of pounded ice or snow to the head ; as this would be sufficient to prevent the determination of the blood thither, which might otherwise be the result of a partial immersion.

The happy result of many maniacal cases, treated by Dr. Brown of Bath, establishes the beneficial effects arising from the long-conti-

foot high ; and continued him under it, as long as his strength would permit. This succeeded so well, that after his return home, he fell into a deep sleep, for the space of twenty-nine hours, and awakened in a quiet and serene state of mind as ever, and so continues to this day ; it being now about twelve months since.”

* First Lines, Sect. MDLXX.

† See the note on Hydrophobia, p. 149.

nued application of cold water to the head, independently of the general immersion of the body. The method pursued by him, was to wind a handkerchief round the head, which was kept constantly wet by means of a sponge, until it produced a shivering fit; it was then desisted from for about an hour, more or less, and re-applied as before. This inconvenience never occurred after the handkerchief had been applied for twenty-four hours. Between thirty and fifty hours from the commencement of the application, sobbing and sighing came on, which were deemed the criteria of the incipient return of rational ideas. The application was occasionally extended along the course of the carotid and subclavian arteries. The Doctor continued his application from seven to fifteen days, and justly observes that he should not have hesitated to continue it for a much longer time, had it been found necessary.

Dr. Currie relates the history of a violent and ungovernable maniac, who was thrown into the cold bath, in the height of a paroxysm of frenzy. A lucid interval of twenty-four hours succeeded the first immersion. Upon the occurrence of a second paroxysm, this treatment was repeated

five different times, till he could not leave the bath without assistance. He became completely calm and rational in the bath, and recovered from that day.

Dr. Rogers records a case where ice was rubbed over the head of a maniacal patient, only four days after the removal of a large blister. Under these circumstances, the skin must, of course, although in a healing state, have been extremely irritable. The remedy was at first applied by the attendants, but with some caution. The patient, at length, at his own earnest request, had the lump of ice entrusted to his own hands. He rubbed it with more force than they had ventured to use, with the highest apparent gratification to his feelings, and with the production of composure and sleep.*

Dr. Rush relates the case of a maniac in Virginia, who having eluded the vigilance of his attendants, made his escape, and passed the night in the open air, in a swamp. The sudden chill so much reduced the morbid excitement, that in a few days, his reason was restored.

* Medical and Physical Journal, Vol. vi. p. 10.

CHAP. XI.

OF THE USE OF COLD IN TWO GENERA OF
THE CACHEXIÆ, TYMPANITES,
AND DROPSY.

I Shall not have occasion to detain the reader by remarks on many diseases under this head: they belong in general to the class of *astheniæ*; and according to the principles of its operation, which I have attempted to establish, the application of the remedy which is the subject of these pages, would not appear to be indicated. Yet in some of them, where the *asthenic* state appears more equivocal, it will be found to have been beneficial. The first of these is the *Tympanites*, a disease, the cure of which, in its confirmed state, may be reckoned among the most difficult efforts of the healing art. In this Dr. Cullen observes that “ cold drink has been constantly prescribed, and cold bathing has been

employed with advantage : and there have been several instances of its being suddenly and entirely cured by the repeated application of snow to the lower belly.”*

The various species of Hydropical affection, are perhaps more frequently than is generally apprehended, accompanied by a sthenic diathesis. The arterial action is sometimes tense ; but is more frequently found to be opprest, and to increase considerably in force and activity after the use of depleting remedies. It has been defined by some practical writers, to be an inflammatory disease accompanied by watery effusion ; and while inflammatory symptoms exist, it might be expected that the application of Cold would produce beneficial effects. Dr. Monro notices the efficacy of travelling in cold weather in this disorder. It should seem, says Dr. Rush, in speaking of this circumstance, that the cold here operates as a sedative, and co-operates with the fatigue produced by labour or exercise, in reducing the tone of the arterial system.

* First Lines, Sect. 1642.

Since an increased discharge of urine succeeds the application of cold to the cutaneous surface of the body, might it not be advantageously used with that indication in diseases of this kind? An observation of Dr. Darwin, in his chapter upon the retrograde absorbents, may afford a reasonable ground for this practice. When the body is suddenly exposed to cold air, or cold water, he supposes that the lymphatics of the bladder and intestines, invert their motions, and return the fluids which were previously absorbed, into the intestines and bladder.*

It is not the object of this Essay to enter into an examination of the theories of any particular disease; but we have an example in hydrocephalus internus of excessive arterial action relieving itself by watery effusion, (*see Zoonomia, Vol. II. Addition 2,*) and of the prevention of this fatal consequence by timely deple-

* Dr. Baynard notices this fact, and gives the following curious and quaint explanation of it, derived, no doubt, from the mechanical philosophy which was at that time in vogue. "In the dropsy," says he, "especially in Anasarca, the cure may be solved, by supposing that the *Frigidity* and *Pressure* of the water, restraining and contracting the whole body, squeezing equally alike from the *Peripheria* to the *Centre*, the morbid fluid is forced from the habit into the channels, and by secretion thrown off by urine."

tion, when carried to a sufficient extent; and it has already been observed that cold has a powerful sedative agency in diminishing this inflammatory action, and abating the pain which often accompanies its onset.*

* See Page 123.

CHAP. XII.

OF THE USE OF COLD IN THE EPISCHESES,
BUT PARTICULARLY IN ISCHURIA.

THE agency of diminished temperature is, at once, powerful and salutary in two diseases of this class, Obstipatio and Ischuria. The former is so frequently an attendant symptom of Colic, that it may be considered as already treated of under that head; and the reader is referred thither for ample proofs of the efficacy of cold in removing the most obstinate cases of it. In slighter degrees of the latter, its efficacy is not unknown to many who are not Members of the Medical Profession. It is not an uncommon practice to raise children when affected with a temporary Ischuria from their beds, and place them to stand on a cold stone or marble hearth. In general, this plan at once removes the obstruction.*

* The theory of the production of this effect has been given in the last chapter, under the head of Dropsy.

With the same view, Dr. Sydenham was accustomed to make his patients in small-pox, rise from their beds, and remain for some time in the cool air, when they were labouring under a symptomatic ischuria. After a short time the urine flowed freely.

I shall beg leave to insert in this place, an abstract of three curious cases, recorded by Dr. Baynard, Dr. Currie, and Dr. Rogers. They might, perhaps, have been with equal propriety, classed under the head of spasmodic affections : but having in general, pursued the arrangement of Dr. Cullen, it is possible that the reader may expect to find them in their present situation.

Dr. Baynard's case is thus related. "A gentleman at a long trial at bar, in a title of land, where his all was at stake, held his water so long, that when the trial was over, he went to make water, but could not, the fibres of the bladder being so much and so long extended, that they could not contract. The gentleman lay all night in extreme pain, and yet with a great desire to urinate, but could not. The next morning he took several diuretic drops, as *Spir.*

Nitri dul. &c. in white wine, &c. but to no purpose. I hearing of this by chance, bade his friends strip him naked, and wrap him round the waist and belly with a wet towel ; which as soon as done, he made water immediately, but was for some time afterward troubled with the Strangury."

The case related by Dr. Currie, is that of a gentleman of Bristol, who was instantly relieved of an obstinate stricture of the neck of the bladder, of thirty hours duration, during all which time not a drop of water had passed, by placing his feet on a marble slab, and dashing cold water over the thighs and legs. The effect was instantaneous. The urine burst from him in a full stream, and the stricture was permanently removed. The common remedies, particularly opium and bleeding, and each of them very largely, had previously been used in vain.

In Dr. Rogers's case, the obstruction had continued for thirty-six hours ; bleeding, purging, emollients, and turpentine clysters, opium, bougies, and the catheter, had all been tried without effect. By his advice, the legs of the

patient were put into cold water, taken fresh from the river,* the ice being broken for that purpose, and kept there for five minutes ; at the end of this period they were taken out, wiped dry, and he was put into bed. In a few minutes he called for an urinal, and although the discharge was only by drops, he by degrees, filled the glass ; and before morning, had discharged a chamber-pot full ; from which time the passage became free. It is not improbable, that if the remedy had been more suddenly applied, or continued for a longer period, the relief would have been more immediate.

* This case occurred in Russia ; and Fahrenheit's thermometer at the time, was at 11 degrees below Zero.

CHAP. XIII.

OF THE USE OF COLD IN BURNS.

ALTHOUGH it is not my intention to enter into the consideration of the extensive use of Cold, in a variety of cases, where partial inflammation succeeds mechanical violence, and which come strictly under the province of the practitioner in surgery, I have allotted the present Chapter to a view of the great efficacy of Cold in injuries from fire. In such cases, it has been freely and extensively used. Indeed, in accidents of this nature, refrigerating applications present so obvious a mode of relief, and are so readily obtained, that they have been resorted to, almost universally. Considerable doubts, however, have been lately advanced, with respect to the comparative advantages of stimulant or refrigerant applications, in injuries of this kind. The application of spirits of turpentine, has been recommended by Dr. Kentish, in his

ingenious Essay upon this subject; and his communications have elicited a considerable mass of evidence in its favour. I shall not pretend to decide upon the comparative merits of the plans in question; but shall content myself with mentioning a few instances of the efficacy of cold applications in such cases, which have a claim to insertion in the present essay.

In the winter of 1797—1798, the Lady of the Commandant, on Governor's Island, in the neighbourhood of New-York, inadvertently burned one of her fingers, the whole length, against an iron. The surgeon of the garrison, who was present, immediately caused it to be placed in cold water, which was frequently applied for a few hours, and the burn was entirely cured. In the same season, some of the people of the garrison were employed in killing hogs; and a large quantity of hot water was prepared as usual, to scald them. By accident, a pailful of this scalding water, was thrown over the foot of a soldier. Cold water was immediately dashed on it, and frequently renewed during the space of half an hour, when he was able to proceed with his business. Many years ago, (the

reporter received the facts from the persons concerned) two brothers, apprentices to a hatter, were employed in taking hats from a boiler, and rinsing them out in a very large tub of cold water. Some dispute arising, one of them lifted the other in his arms, and seated him directly in the boiler; but being instantly struck with terror at what he had done, without loosening his hold, he again lifted him from the boiler, and seated him in the tub of cold water. The youth who had been thus hurried through these extremes of temperature, had on a pair of wide linen trowsers, and received no other injury than a narrow blister, which was formed directly under the waist-band, and incircled his body.*

The advantages derived from the use of spirits of turpentine, have been particularly insisted upon in cases of injury from explosions of gunpowder. One case has occurred within the knowledge of the Author, where the liberal use of cold water was attended with a result equally satisfactory. The son of a gentleman of eminence in the law-department of the United States, was amusing himself with some fire-

* New-York Medical Repository, Vol. I. p. 532.

works, and in consequence of a sudden explosion, had his face and breast terribly scorched. Medical assistance was immediately obtained, and he was directed to be undrest, and laid upon the sacking of a bed. In this situation, cold water was copiously applied for a considerable time. The pain was relieved; the patient fell asleep, and awoke in the morning, with no other injury than a slight superficial redness, which soon entirely disappeared. The advantages of the potatoe poultice are familiar to almost every one's experience, and they certainly arise from its long continued abstraction of the heat of the injured part. It is unnecessary to multiply examples under this head, especially as Sir James Earle's Treatise furnishes such full and satisfactory information upon the subject.

A writer on the subject of Burns, in the Medical and Physical Journal, remarks that the beneficial effects of the stimulating plan are most evident in those cases, where the injury penetrates no deeper than the cutis.* It is precisely under such circumstances that I should

* Vol. V. p. 236.

expect the most advantage from the refrigerating treatment. But in cases where the injury was very considerable and extensive, and attended with loss of substance; and where violent shivering, with a small pulse had succeeded the accident; I should consider, conformably to the laws of its operation, which it has been attempted to establish, that its application would be hazardous, and its effects uncertain.

CHAP. XIV.

GENERAL SUMMARY.

I Have thus completed my design of giving a general view of the Effects of Cold, as a remedy in certain diseases. The catalogue of these diseases is extensive. I apprehend that they will, in general, be found to be more or less attended with inflammatory symptoms, or an increased heat of the surface, and that the relief afforded by cold, results from its diminishing the urgency of those symptoms by its sedative operation.

Could prejudices be overcome, perhaps, water might be as generally used to cool febrile heat, as to extinguish elementary fire.* Patients or their friends, may often express apprehensions of catching cold from such applications ; but must

* A case of Typhus is recorded in the Third Volume of the Medical and Physical Journal, which was cured by the use of this remedy alone. (See page 54.) The burning heat of Scarlatina, as has been already seen, is also completely extinguished by the same means.

not the idea of catching cold in a fever, appear to the attentive Medical Practitioner an absurdity? We have already seen that fever patients, though carried in open waggons, and exposed to the severity of the dreadful winter of 1793, and 1794, sustained no such inconvenience. On the contrary, they all recovered.* Dr. Rush relates, that in the afternoon of one of those days in which his system was impregnated with the contagion of the Yellow Fever, he felt so much indisposed, that he deliberated whether he should go to bed, or visit a patient about a mile in the country. The afternoon was cool and rainy. He recollected at this time, a case related by Dr. Daignan, a French physician, of a man who was cured of the plague, by being forced to lie all night in an open field, exposed to a shower of rain. He got into a one-horse chair, and exposed himself to the rain. It was extremely grateful to his feelings. He returned in two hours, when, to his great satisfaction, he found that all his feverish symptoms had left him, nor had he the least return of them afterwards. He also gives us an extract of a letter from Dr. Caldwell, who acted as surgeon of a

* See page 23.

regiment in the expedition against the insurgents in the Western counties of Pennsylvania, in October 1794, containing an account of his having been cured of a fever, by a more copious use of the same remedy. "I was, (says Dr. C.) to use a vulgar expression, *wet to the skin*, and had no opportunity of shifting my cloaths for several hours. In consequence of this thorough bathing, and my subsequent exposure to a cool air, I was relieved from every symptom of indisposition in a few hours, and have enjoyed more than my usual stock of health ever since." *

But enough has been said upon the subject of fever; let us examine how far the action of cold in the other diseases treated of in this work, agrees with, or can be accounted for, upon the laws of its agency laid down in the first chapter. We come first to the Phlegmasiæ

* Medical Observations and Inquiries, Vol. IV. p. 91.

The effects produced in these cases, by regular and long continued immersion, are exactly conformable to the doctrine with respect to the administration of cold, which it has been attempted to establish in the preceding pages. The object in view, in the exhibition of reduced temperature in fever, is to abstract febrile heat; and this object has appeared to the Author to be best secured by its long-continued and persevering application. Hence it is, that although he has acknowledged the value and importance of the principle laid down by Dr. Currie, he has, upon various occasions, taken the liberty of questioning whether his be the most eligible mode of applying the remedy.

of Dr. Cullen. In some genera of this class the diseased action may be seated in some deeply-lodged internal viscus, and the heat of the surface may be inconsiderable; in others, although the seat of the disease may be still internal, there may exist a sympathy between it and the skin, which may enable us to act upon the former, by the medium of the latter. In the former case, although the local inflammation might be considerable, yet being inaccessible to the action of any external remedy, no good effects could be expected from the agency of cold; in the latter they might be confidently hoped for. Carditis, Splenitis, and one or two others might be adduced, as instances of the former class of diseases. Enteritis, and perhaps Gastritis of the latter. There is often a coldness of the surface in Phrenitis; but we are able, in this instance, to apply our remedy so immediately to the seat of diseased action, without affecting the temperature of the other parts of the body, that its agency is at once more powerful and salutary than in many other diseases of this class. A similar observation may be made with respect to Cynanche and Parotitis Suppurans. In Pneumonia and other affections of the Lungs,

if cold air be inadmissible, or appear to be injurious, this circumstance arises in all probability, from the greater quantity of oxygen contained in a volume of air more highly condensed than usual,* which, being applied so directly to the injured organ, may act as a morbid stimulus. But cold applications to the surface of the body, are, as we have seen, not only admissible, but advantageous; and they may diminish the excessive action of the lungs, from the sympathy which is so well known to exist, between them and the skin. In Catarrh, which exhibits inflammatory action in one of its most simple forms, the agency of cold, if administered to a sufficient extent, appears absolute. In Gout and Rheumatism, whenever the inflammation is acute and active, its efficacy appears in the al-

* This idea may derive some support, from contemplating the distressing sensations experienced from the admission of intensely cold air into the lungs. When the French academicians wintered at Tornea in Lapland, the external air, when suddenly admitted into their rooms, converted the moisture of the air into whirls of snow; *their breasts seemed to be rent when they breathed it*, and the contact of it was intolerable to their bodies. Boyle records a similar instance in his *Philosophical Treatise upon Cold*, (*Boyle's Works abridged, Vol. I. p. 655,*) upon the authority of Dr. Fletcher, ambassador from England to Russia. "I found," says this latter gentleman, "that when I came out of a warm room into the cold, I sensibly drew my breath stiff, and even stifling with cold, *so powerfully and suddenly does the intensely refrigerated air work upon the organs of respiration.*"

most instantaneous relief of pain ; but it relieves it only where this active inflammation is evident and external ; and it would, I have no doubt, be found as injurious in atonic, or mis-placed Gout, as it is valuable and efficacious in the tonic forms of that affection. From reasoning *a priori*, we should be led to infer its importance in the Exanthemata ; where the determination to the surface, and the external heat, are in general so considerable ; and facts justify the expectation. The heat in Scarlatina, according to Dr. Currie, appears, as has been remarked under its proper head, to be greater than that of any other febrile disease of this country ; and in what disease do we observe our remedy exerting a more prompt and decided efficacy ? The Materia Medica furnishes no article except diminished temperature, capable of extinguishing this formidable complaint, so completely, as to prevent the efflorescence, or sore-throat, which have been deemed its characteristic symptoms. The burning heat of the oriental Plague, is in like manner, quenched by this powerful, though simple agent, and the actual accension of a part of the body which occurs in *anthrax* is prevented.

In Hæmorrhagy, its salutary effects are striking. They appear to be produced in some cases, by a direct, and in others, by a sympathetic influence. It is unnecessary to remark, how frequently diseases of this class are connected with symptoms of local or general inflammation, and with an active state of the arterial system.

In Dysentery, the only disease which has been adverted to under the head of the *Profluvia*, symptoms of Pyrexia are always more or less evident; and the extensive sympathy between the skin, and the internal surface of the alimentary canal, assists the action of the remedy.

In the Comata, the symptoms of opprest action, and local determination, are too evident to be mistaken; and although instances of its beneficial application, are by no means unfrequent, it is probable that a more general use of it would considerably extend its triumphs.

It may possibly exert some mechanical agency in relieving convulsion, and hence may arise the instantaneous relief, experienced from its use in some genera of the spasmi; but, in the

case of Tetanus, mentioned in page 140, which was cured by wrapping the patient in wet sheets; the benefit derived cannot be referred to this source, but must be attributed to those debilitating powers by which it takes down morbid excitement. In like manner, I suppose, the case of Colic,* mentioned in page 144, to have been a simple inflammatory affection, and to have been relieved upon similar principles; although in conformity to the authority of Dr. Cullen, I arranged it under the Spasmi.

In the Vesaniæ, its sedative powers diminish the active inflammation in Mania Furibunda, and accumulate excitability in Melancholia and Amentia; effects, which could only be looked for from a remedy belonging to the class of Sedatives. In the Cachexiæ, as diseases of this class are so often characterized by debility, and deficient vital energy, we find the rage of its curative operation exceedingly limited. In the

* One of the earliest advocates for the employment of cold affusion in fever, has remarked, that "in all cases where there are visceral obstructions, cold-bathing does much mischief," (*Medical Facts & Observations*, Vol. VII. p. 4.) But how can the justice of this opinion be reconciled with the multiplied instances of its successful employment, already detailed under the head of Colic?

Epischeses, its beneficial effects appear to be owing partly to sympathetic action, and partly to the analogy by which diseases under this head, partake of the symptoms of the Spasmi, and yield to similar remedies. In the different forms of injury excited mediately or immediately by elementary fire, our remedy acts upon the same principle, and with the same beneficial effects, that it evinces in resisting the local determination which produces anthrax in Plague.

It may be objected to the theory which contemplates Cold as a strictly sedative remedy, that we have instances of its successful application in asthenic diseases, as Typhus, and the like. The name of Typhus has, perhaps, been too generally applied; and its division into *gravior* and *mitior*, will appear very insufficient to the observer of Nature, to include, or to characterize the various febrile affections, to which this appellation has been given. But without pursuing farther the ideas which this observation would suggest, it may be observed, that symptoms of general debility may exist, while there is a preternatural excitement upon the surface; “*Calor*,” (not as stated by Dr. Cullen, “*pa-*

rum," but) "*plurimum auctus*," which expends the sensorial power, and is taken down by the sedative operation of cold.* Might not a similar remark be offered in answer to the objections which are made to the use of cold applications in Gout? It is contended, and perhaps with justice, that Gout is a constitutional disease. So also is Typhus. In both cases we relieve the urgency of a distressing local symptom. Why should we be more apprehensive of the consequences of repelling heat from the extremities than from the surface in general?† Is not this objection founded upon principles similar to those which so long forbade the use of cold in small-pox? But it may be objected that cold affusion has, in some instances, been used with advantage, where the action upon the surface was inconsiderable, or scarcely above the natural; admitting the accuracy of this statement, the powerful reaction which takes place after such an extensive system has been brought into sudden quiescence, should, in such cases, be taken into the account. This is sometimes

* Consult *Zoonomia*, Vol. II. Article *Somnus*.

† Dr. Kinglake has an observation something similar, (*Medical and Physical Journal*, p. 459.) The coincidence was not known to the Author when he wrote the above sentence.

so excessive, as to induce catarrhal inflammation, in subjects remarkably excitable, or labouring under constitutional debility.

It appears then, upon taking a general review of the subject, that Cold exerts its salutary agency in three ways. First, in cases where the general action of the system, but especially where the heat of the surface, is increased, it abstracts or extinguishes that heat, and diminishes that excess of action; but without any phenomenon which could authorize the belief of its effecting this by means of any stimulating process. Whether this heat or action be excited by the stimulus of exercise, of elementary fire, of alcohol, carbonic acid gas, opium, or those irritating causes, whatever they may be, which produce the phenomena of fever, the remedial effects of Cold are uniformly sedative: heat is abstracted, or action diminished. Its operation here appears under its most simple form.

Secondly, in a large train of other diseases, its agency appears sympathetic. The extensive connexion between the skin, and the

internal surface of the stomach and alimentary canal, enables us in many cases, to act upon the latter by the medium of the former. The application of Cold to the external surface of the body, is connected by one of the earliest associations which the new-born infant forms, with an increased peristaltic motion; and hence arises the great relief experienced from its exhibition, in cases of obstinate constipation.*

To these effects should be added, in the third place, its mechanical agency; which may operate in some cases, where affusion of water in considerable bulk is performed; hence a febrile or convulsive paroxysm may, under some circumstances, be more speedily or effectually arrested, by the sudden shock which accompanies such a process, than by its more gentle or uniform application.

In thus detailing the beneficial consequences resulting from the application of a single powerful remedy, let it not be thought that I mean to assign to it an undue importance, or that I suppose it capable of subduing disease without

* See *Zoonomia*, Vol. I. Sect. xvi. 8. xxix. 4.

the co-operation of the other means with which the Materia Medica furnishes the practitioner. Far otherwise : but I hope that the authorities cited in this little work, will evince that Providence has placed in our hands an agent of considerable efficacy ; which can at all times, and in almost all situations, be easily procured : which, from this circumstance, is particularly valuable to the more indigent classes of our fellow-creatures ; and the importance of which, has, in general, been hitherto entirely overlooked, or too slightly appreciated,

APPENDIX,---No. I.

A CASE OF CEPHALALGIA, CURED BY DRINKING LARGE QUANTITIES OF COLD WATER.

I Had not any previous opportunity of introducing the following curious and anomalous case, of a violent and distressing head-ach, cured by drinking cold water. I insert it as a solitary fact, without deducing any arguments from it in favour of the remedy, which is the subject of the preceding pages.

An officer in the service of the Duke of Wirtemberg, had been for some time afflicted with so severe a head-ach, that he had even submitted to the operation of the trepan in hopes of relief, though without effect. In this state he was advised to make use of a remedy very simple in its nature, but which was asserted to be infallible, provided the patient regularly persevered in its use. It consisted in drinking six quarts of spring-water daily for three months. Although he had little faith in the remedy, he so soon perceived a mitigation of his complaint, that he persisted in the use of it; and within the time prescribed, was relieved from a disorder, which for eighteen months had baffled every medicine, and deprived him of every enjoyment. No particular regimen was enjoined, except that excess in eating or drinking should be cautiously avoided. At the period when the history of this case was related, the patient had been free from every symptom of the disease for nearly three years.*

* Medical Commentaries, Vol. XVII.

From the profession and country of this patient, and from the mode of treatment at last found effectual, it may, with great probability, be inferred that he had been habituated to potations of a very different kind; and that his head-ach was a sympathetic effect, produced by some derangement in the digestive organs, which was removed by the cautious regimen recommended, and the refrigerating effects of his daily draught.

A writer in the First Volume of the Monthly Magazine, apparently not professional, observes, that he has often experienced, that for the sore lassitude, the fatigued and worn-out sensation of the stomach, the slackness, torpor and languor, accompanied with head-ach, which succeeds an intemperate use of wine, it is an expeditious and efficacious remedy to swallow ice cream. "Perhaps," he continues, "in the more permanent analogous disease, called, I believe, dyspepsia, a like regimen might be found advantageous." That the use of ices might be advantageous in the primary state of indirect debility, succeeding the excessive use of wine, I have no doubt; (*see the Section on Intoxication, p. 123,*) the present writer, however, has not distinguished with sufficient accuracy, the proper period for its administration. The head-ach to which he alludes, seldom comes on till the morning succeeding a debauch, and at this period, I apprehend, that general experience would militate against the introduction of ice, or any cold fluid devoid of stimulus, into the debilitated stomach.

APPENDIX,---No. II.

CONTAINING THE RESULT OF SOME EXPERIMENTS, MADE WITH
A VIEW TO ASCERTAIN THE EFFECTS OF COLD WATER
ON THE PULSE.

AN ingenious Medical Friend, to whom I had shewn the Manuscript of the former part of this Volume, expressed his surprise at the experiment related in page 5, and intimated strong doubts of its accuracy. In reply to his objections, I could only urge that I was well acquainted with the person who had been the subject of it, that I had frequently heard it spoken of, and that I entertained no doubt of its fidelity. He then referred the effect related, to some particular idiosyncrasy, and with a view to ascertain this point, immersed his own feet in cold water upon two different occasions, for a considerable time. The result was, indeed, widely different. Instead of being diminished, the frequency of the pulse appeared, in both instances, to be increased. At this, I was at first a little surprised.* I felt no doubt, however, that al-

* In order to ascertain, whether any particular idiosyncrasy existed in his case, the following experiment was made upon a stout, healthy young man. After sitting for upwards of an hour in a room without a fire, in the month of February, and during that time, abstaining as much as possible from exertion, he immersed his feet and legs at eight minutes past one, in a pail of water, just drawn from the pump. The temperature of the room was 52, that of the water 45. His pulse the moment before the immersion, beat 69 strokes in a minute. At ten minutes past one, there was no alteration, at fifteen it was increased 3 strokes, but it was so weak as to be scarcely perceptible. He now began to shiver, the knees in particular, knocked involuntarily against

though the arterial action might possibly be increased in frequency, its force must be greatly diminished. This observation I stated to him, but other avocations prevented him from pursuing his researches. In fact, he was disposed to entertain the idea, that Cold was, in its first operation, a stimulant, although he could not but acknowledge its subsequent sedative operation. In consequence, however, of this objection, I determined to ascertain by actual experiment, the effects of cold water upon the pulse. The return of the bathing season presented me shortly after, with an eligible opportunity of making a variety of trials upon several of my friends, who willingly submitted to the necessary experiments, at Rennison's Bath, in the neighbourhood of this city. The result of these, I shall now proceed to lay before the reader. It will be seen that the temperature of the water was never below 59 degrees of Fahrenheit, and in general, exceeded that degree. The experiments were made in the morning, before breakfast, and the subjects of them had all a walk of about a mile to perform, before they reached the bath.

No. 1. JULY 21, 1804.

An accident prevented my ascertaining on this day, the difference between the temperatures of the water and the air ;

one another ; yet upon minute enquiry, the sensation of cold was not particularly complained of, as severe or distressing ; at 20 minutes past one, the pulse returned to its former standard, 69. The shiverings did not increase ; and at 23 minutes, exactly fifteen from the first immersion, it beat 73, and the stroke was rather fuller. Not wishing to expose this subject to any further inconvenience, his feet were now withdrawn. It appeared probable in this case, that the feet having been previously much chilled, as was stated to be the fact, by remaining so long in a state of inaction in a cold room, the pulse was lowered considerably beneath its ordinary standard ; which would account for the trifling variation observed. It may be remarked, that he had previously suffered from chilblains, which had operated as an encouragement to him to submit to the immersion. They entirely disappeared, and troubled him no more.

but, to the sensations, there was no perceptible variation in the relative state of both, from that observed at the subsequent experiment. The subject A. was a stout healthy young man, in the vigour of life, and of a sanguine temperament. B. was a youth, about fifteen; his infancy had been unhealthy; his health at this period did not appear very firm, and his constitution was easily susceptible of any impression. C. was a stout, tall young man, apparently in good health, but not such robust health as A. The pulse of each being examined in the air, before immersion, was found to be as follows.

A. 72, rather feeble, B. 76, tremulous, C. 66, very regular and equal.

After immersion from two to four minutes, all having plunged in and swum, they were again examined.

A.'s now beat 104 strokes, and became much smaller and weaker, than before immersion. B.'s 132, very faint and thread-like. C.'s 108, smaller and weaker than before. They continued in the bath, swimming and diving, for nearly fifteen minutes, and at the moment of immersion, the pulse of A, was found to be 120, still smaller and weaker; that of C. 138, still more remarkable in both particulars; and B.'s 144, counted with great difficulty, and scarcely perceptible.

After emersion and dressing, at an interval of nearly half an hour, the increased frequency had not subsided; A.'s beating 88; B.'s 96, and both very feeble. C.'s was less affected; it beat 72 strokes, and was tolerably full. At the same time, I had the opportunity of feeling the pulse of a young man, of short stature, very athletic in appearance, and of a rigid fibre, who was noted for the length of time which he was accustomed to spend in the bath. He had that morning been immersed from 20 to 25 minutes, and after having been drest for some time, the radial artery was found to beat 120, and in smallness and feebleness, to resemble that of a person in an advanced stage of typhus fever.

The temperature of the air on this day was 67, that of the water 64. A. and B. were subjects of this set of experiments also, which in one respect, were a little varied; as all the parties, with the exception of G. the last but one in order, plunged in, and came immediately to the spot where I stood, after swimming a very few strokes only. They were examined in the order set down, and as the pulse was in general felt for a longer space than half a minute, the latter had been immersed some little time longer than the first.

The results were as follow :

	Before Immersion.	Immediately after.	Coming out, after being Immersed about a Quarter of an Hour, and using Exercise.
A.	90	81	120
B.	99	120 very small	120
D.*	78	Imperceptible	120
E.†	84	Ditto,	132
F.‡	88	No Observation	140
G.§	120	After walking leisurely down the steps, and dipping his head	150
H.¶	92	120	132

* This subject was about 16 or 17 years of age, of a constitution rather delicate, but not often seriously indisposed.

† A healthy young man, with an exquisitely marked sanguineous temperament.

‡ F. The temperament and constitution of this gentleman, appeared to resemble that of G. in Experiment first.

§ G. Constitution rather delicate, thin.

¶ H. Stout, Healthy, and robust.

A third set of observations was made a few mornings afterwards, upon the greater part of the same party; but with so little difference in the results, that I shall not trouble the reader with the detail.

The muscular exertions which had been used in swimming in the preceding Experiments, with the exception of G. only in the second set, had, as I conceived, materially contributed to the acceleration of the pulse, which occurred in almost every instance. In order to ascertain this point, I prevailed upon the whole party to walk into the water, and dip their heads immediately, with as little muscular exertion as possible. This produced some variation from the effects before noted.

No. IV.

AUGUST 2d,—Air 60°—Water 65.

<i>Before Immersion.</i>		<i>Immediately after.</i>	
A.	75	57	
B.	81	90	very tremulous.
D.*	100	94	Intermitting
K.†	81	84	
L.‡	60	51	

* Being detained longer than his companions, he had run down to the bath, in order to overtake them, and his system was in consequence excited.

† Thin and delicate in appearance.

‡ A stout, healthy subject.

It is observable, that in two instances in this set of experiments, although muscular exertion was as much as possible abstained from, the pulse was accelerated; still it was greatly diminished in force, although increased in frequency.

Upon two subsequent occasions, I endeavoured to ascertain the effects of a partial immersion, by prevailing upon the whole party to descend, step by step, into the bath. At the 1st step, the feet and ankles only were immersed; at the 2d step, the water reached to the knees; at the 3d, it rose nearly to the top of the thigh; at the 4th, nearly to the umbilicus; and, at the 5th, to the chest. The respiration was much hurried in all, during this gradual immersion;

more particularly so in the less robust subjects; but, at the moment that they immersed the head, as well as the whole body, the frequency of the pulse was, almost in every instance, strikingly diminished. Did the partial application of cold to the inferior extremities, produce a contraction of their superficial vessels, and thus increase the action of the superior extremities, which were held up for the purpose of examining the pulse? and was the action equalized by the total immersion which succeeded, producing a proportionable diminution in the frequency of the pulsations at the wrist?

No. V.

AUGUST 17th.—Air 59°—Water 60.

<i>In the Air.</i>	<i>First Step.</i>	<i>Second Step.</i>	<i>Third Step.</i>	<i>Immersed.</i>
A. 72	96	78	72	72
B. 81	80	112	—	96
D. 90	96	120	—	87
K. 96	128	168	—	150

No. VI.

AUGUST 28.—Air 62°—Water 59.

<i>In the Air.</i>	<i>1st Step.</i>	<i>2d.</i>	<i>3d.</i>	<i>4th.</i>	<i>5th.</i>	<i>Immersed.</i>
A. 78	108	138	96	72	80	84
*D. 84	100	126	148	144	105	123
†M. 105 very tense.	108	104	118	135	168	160

* It was with extreme difficulty, that the pulsations in this subject could be numbered, they were so exceedingly faint.

† This was an interesting subject, as he laboured under a considerable degree of mental derangement, and was shortly afterwards removed to a house of confinement. At the moment of his entering the bath, his pulse beat like iron. As it has been so frequently remarked, that Maniacs are insensible to the action of cold, the great variation of the pulse in this case, may appear rather extraordinary. It would, perhaps, afford an additional argument, in proof of the powerful agency of

The effects of partial immersion in these experiments, certainly differ in a considerable degree, from those related by Dr. Rush, and Dr. Marcard. I must confess, that their general result was as unexpected as on the occasion already related in the present Section. I was prepared in all circumstances, to expect a diminution of the frequency, as well as the force of the arterial action, upon the application of cold water; nor perhaps, had it not been for the objections urged by the friend already alluded to, should I ever have attempted to ascertain the exactness, or rather the uniformity, for of its exactness in the instance recorded by Dr. Rush, I still feel no doubt, of these sedative effects. In the instances submitted to the reader in this Appendix, the observations were made with care, and are reported with fidelity. I have not attempted to bend them to any pre-conceived theory. Yet, I do not conceive the results above stated, to militate in any degree against the doctrine which it has been the object of the preceding pages to establish, if they be attentively considered. For although the frequency of the arterial action was, with scarcely any exception, increased, its force was, in all cases, diminished. In many, from the combination of extreme weakness and rapidity, it was scarcely possible to be counted. I have already observed, (*See Note to Page 6*) that I wished to confine the proof of the sedative operation of cold, to its diminution of the force of the pulse; not of its frequency. The increase of its frequency, however, admits, if I mistake not, of a satisfactory explanation. Similar effects would have been produced, if a considerable quantity of blood could have been abstracted with equal celerity: the pulse would have become quick and tremulous: yet no one will question the sedative effects of Venæsection.

our remedy, in the treatment of this, the most melancholy of human maladies. The force of the pulse was greatly reduced during his descent into the water, but the effect was temporary; and it was found to beat 104, with little, if any diminution in that respect, after he had quitted the bath, and was drest.

May we not be allowed to conclude from some of the facts above detailed, that too much attention has been paid to the frequency of the pulse? In truth, is not every condition of the pulse more important than its frequency? It is well known, that in some diseases, it is scarcely affected in any way which can assist the practitioner in ascertaining the curative plan to be pursued; John Hunter has long since remarked, that its indications are not to be trusted in affections of the head; and Dr. Cox delivers a similar observation, as the result of his extensive experience in cases of maniacal affection. I am well acquainted with a gentleman nearly fifty years of age, of a sanguineous temperament, in whom the pulse scarcely ever falls below 100 strokes in a minute: and a young friend, of eighteen, has a pulse, which, except under the stimulus of some diseased action, never exceeds sixty. Supposing either the one or the other attacked by disease, into what errors of practice might not a medical adviser be led, who attended to the frequency more than to the other conditions of the arterial action.

May we not also deduce an important caution with respect to too long continuance in the bath, however the water may be tempered by the rays of a summer sun? In every instance where the immersion had been long continued, (and the fact was ascertained by a multitude of trials, which are not mentioned in this paper,) the pulse was remarkably accelerated, and as remarkably weakened. The features were also in many instances contracted, and some subjects almost underwent a shivering fit, before they recovered the accustomed temperature of health.

It yet remained to ascertain what would be the effects of continued immersion without exercise; and upon two subsequent occasions this also was tried. A new subject submitted to these trials, apparently in delicate health: although fourteen years of age, he had scarcely attained the size, or appeared to possess the stamina of a healthy boy of twelve; and his pulse was, before undressing or using any particular exertion whatever, unusually frequent. I shall designate him by the letter N.

AUGUST 31.—Air 65°—Water 62.

<i>In the Air.</i>	<i>Two Minutes.</i>	<i>Four Minutes.</i>	<i>Five to Seven.</i>
A. 87 - - -	76 - - - -	62 - - - -	{ 70 very weak, and threadlike.
B. 84 full - -	112 tremulous	—	
D. 84 feverish	Imperceptible	72 scarcely perceptible.	
N. 129 - - -	84 - - - -	70 too weak to bear more.	

SEPTEMBER 10.—Air 65°—Water 59.

<i>In the Air.</i>	<i>1½ Minutes.</i>	<i>3 Minutes.</i>	<i>4 Minutes.</i>
B. 86 - - -	68 - - - -	40 - - - -	- - - - -
N. 120 - - -	96 - - - -	{ I judged him too weak to bear it any longer.	
K. 98 - - -	114 - - - -	100 - - - -	88

The difference of the temperature between the water and the air, this morning, seemed to affect the sensations more powerfully than usual, and they were unwilling to submit to immersion for a longer period.

At the same time, A. who had been slightly indisposed the preceding day, and still complained of some degree of febrile irritation, walked down the steps of the bath gradually, as in the cases related in the 5th and 6th Sets of Observations.—His pulse in the air was 93, and strong; the first step affected him much more powerfully than usual, and the arterial action was reduced at once to 66 strokes, he stepped hastily down two steps, and when on the third, his pulse being again examined, was found to beat 80 strokes; on the fourth the same; the fifth 93; and the moment after immersion 100, and very feeble. He remained in the bath but a very short time; and as he evidently laboured under some febrile action before his immersion, I was anxious to ascertain the state of his pulse, after he had quitted it. It beat 81 strokes, with the most perfect regularity; and he assured me that every unpleasant sensation was removed.

The sedative effects of cold, are, perhaps, demonstrated in no way more satisfactorily, than in the mode of continued immersion without exercise, which was resorted to in the two last sets of observations; the sinking of the pulse, both

in force and frequency, is under such circumstances, alike remarkable.

Some caution was judged necessary in the continuance of the immersion, when unaccompanied by exercise. In the experiments made by the friend alluded to in the beginning of this paper, the partial immersion was continued for a considerable time. A great degree of febrile heat and irritation supervened, and a very disturbed and agitated night succeeded the experiment.

The above observations are delivered to the world in an imperfect form. They were not at first commenced with a view to their being made public; but, as the result of the two first, seemed novel to some Medical friends, to whom they were communicated, they were prosecuted farther than was originally intended; and it was thought that they might be inserted in an Appendix to the present work, without impropriety.

MAY 18, 1805.

THE delay which has taken place in the publication of this Volume, enabled the Author to make the following experiment this morning, upon two Irish porters. Both were strong, muscular men, and both in the vigour of life, being little more than thirty years old. It was thought that they might, without inconvenience, bear immersion without muscular exertion, for a longer period than had been submitted to in any of the instances above cited. The result was decisive and satisfactory. In the first, who appeared the strongest of the two, the pulse was reduced in four minutes 12 strokes; in ten minutes, 14 strokes, and scarcely perceptible; in about three minutes more, the pulse was nearly obliterated, only 12 pulsations, and those exceedingly faint, could be made out in the space of half a minute. In the other, the pulse was reduced nearly 30 strokes in five minutes, and in ten, 21 strokes; and the diminution of its force was so considerable, that the finger had been applied to the wrist for nearly half a minute, before any pulsation could be detected.

The temperature of the Air on this day, was 51° , that of the Water 52° .

APPENDIX,---No. III.

NOTE ON GOUT.

THE preceding Collections were completed, and a great part of them printed off, before I had the pleasure of perusing Dr. Kinglake's Treatise upon Gout; a work abounding with cases illustrative of the facts, of which a very superficial abstract has been given in page 77, and constituting a valuable addition to our stock of practical information on this subject. The sheet in which the Section upon Gout occurs, was at that time in the hands of the Compositor; I was therefore obliged to defer to this part of the present volume, the few remarks which I wished to add upon the subject, in consequence of the perusal of Dr. Kinglake's work. In the Section alluded to, I have cited, in proof of the antiquity of the application of reduced temperature in Gout, the authorities of Celsus and Hippocrates. But I am far from wishing to derogate from the merit of Dr. Kinglake's scientific application of a remedy only transiently mentioned by these authors; and thus render myself obnoxious to a censure similar to that which he has, with justice, passed upon *A Constant Reader*.* He has established a principle upon the subject; and has, by that means, rendered to humanity, in this excruciating disease, a service of the same kind as has already been rendered by Dr. Currie, in Typhus and Scarlatina. His claim to originality in this respect, is no more weakened by these previous authorities, than that of Dr. Currie, by the indeterminate though striking facts, related by Sir John Floyer, and Dr. Baynard. A vague record of cases, or even of precepts, in-

* Indeed the note referring to the author of this anonymous attack, which was written many months before the Doctor's Treatise was published, will evince that I was little disposed to approve of his *disingenuousness*, to give it no harsher appellation.

culcating the safety and advantage of cold applications to the arthritic limb, is of little value, in comparison with that simple principle which directs the application of reduced temperature as long as inflammation lasts; which keeps that symptom constantly in view; and forbids the practitioner to desist from the administration of his remedy, till its removal be accomplished.

One of the most recent writers upon the subject of Gout, advances many opinions, in perfect unison with those of Dr. Kinglake. Dr. Rush, in his valuable essay upon this disease, particularly inculcates the doctrine that the proximate cause of Gout, as of all other diseases, is morbid excitement; and that in this morbid excitement and action there is nothing specific. Dr. Kinglake in like manner, observes that "the nature of Gout is purely inflammatory; and possesses no specific or peculiar properties, to distinguish it from common inflammation, but what are referable to the structure or organization of the affected parts:" and he elsewhere observes, "that between gouty and other forms of inflammation, no essential difference subsists." "Inflammatory excitement" says he, "is universally similar, whatever be its degree or situation: the variety of remote causes, by which it is induced, generates no correspondent difference in its quality; and may be aptly likened to fire; which, with whatever fuel kindled, burns with identical heat." Dr. Rush contends against the impropriety of distinguishing it, from its various seats, by specific names. He maintains with great earnestness, the identity of Gout and Rheumatism, as long as the ligaments are the seat of the disease. "Many pages" says he, "and indeed whole essays, have been composed by writers to distinguish them; but they are exactly the same disease while the morbid actions are confined to this part of the body. They are, it is true, produced by different remote causes; but this constitutes no more difference in their nature, than is produced in a coal of fire; whether it be inflamed by a candle, or by a spark of electricity." He condemns also the term of misplaced or retrocedent Gout: "as well," says he, "might we talk of a yellow-fever in the brain, in the nerves,

or in the groin, when its symptoms affect those parts, as talk of *misplaced* or *retrocedent* Gout. The great toe, and the joints of the hands and feet, are no more its exclusive seats, than the stomach is the throne of the yellow-fever." In like manner Dr. Kinglake observes, that "misplaced Gout is a misnomer."*

Thus far, both Dr. Rush, and Dr. Kinglake, appear to coincide in opinion; but Dr. Kinglake has extended the identity of tendinous and ligamentous inflammation in Gout and rheumatism, to that induced by a sprain: and I feel confident that this extension of the principle of the unity of inflammatory action, will be highly grateful to the learned Professor. In some other points, they differ very widely; for while Dr. Kinglake would confine the action of gout to ligamentous and tendinous parts only; Dr. Rush asserts, and brings powerful arguments in support of his assertion, that Gout is a disease of the whole system: and sums up his doctrine with these emphatical words, "in short, the Gout may be compared to a Monarch, whose empire is unlimited; the whole body crouches before it." Perhaps, however, this difference of opinion exists more in terms than in reality; for Dr. K. admits of "the diffusion or propagation of Gout from the affected joints, by sympathetic or associative influence of motive power," but changes its name to irritation, when it is arrested upon any particular organ. Dr. Rush observes, that the term of legitimate or true Gout, has been appropriated to ligamentous inflammation; but he extends it to all those affections, which, according to Dr. Kinglake, are produced by sympathetic or associative agency.

If we take a view of the methods of cure recommended by these writers, we shall find that they are exactly conformed to the respective difference in their ideas of the disease. Dr.

* The coincidence of opinion, however, in this place, only exhibits an illustration of the trite remark that "extremes often meet." Dr. Rush rejects the term, from a conviction that no part of the system is the exclusive seat of Gout. Dr. Kinglake does the same, because he denies the possibility of its existence, any where except in the ligaments and tendons.

Rush, considering it as generally affecting the whole system, recommends the general remedies of bleeding, purging, and the whole of what has been called the antiphlogistic regimen, in its tonic, and the cordial and stimulating plan in its atonic form. Dr. Kinglake, in conformity to his more simple view of the disease, restrains his remedial applications to the organ particularly affected.

Dr. Rush's Treatise is, I believe, one of the latest works that has appeared upon the subject of Gout, previously to the publication of Dr. Kinglake; and he has done much towards simplifying our views and ideas of it. For this reason, I thought that it might not be unacceptable to the reader, to point out the coincidences between authors, separated by vast oceans, and taking a very different general view of the subject.

Dr. Kinglake's claim to originality in the principles to which his plan of cure is conformed, appears to me to be well established. That his view of the disease has similar pretensions, will scarcely be questioned. His theory will doubtless excite controversy, but whatever be its fate, the authority of the numerous and important facts which he has brought forward, cannot be shaken; and their value must, of course, be permanent.



APPENDIX,---No. IV.



CASE OF EPILEPSY, REFERRED TO IN PAGE 144.



A CASE has occurred to the Author, which he, at one time, hoped would have furnished an exception to Dr. Currie's observation, on the inefficacy of cold affusion in Epilepsy; but, it is still under cure; and the event has been rendered still more uncertain than it previously appeared to be, in consequence of the imprudence of some relations of

the patient. There is now reason to apprehend, that this remedy will not ultimately prove more efficacious in the treatment of this deplorable disease, than a variety of other agents, which appear capable of suspending its violence for a time, but of which very few are found adequate to effect a permanent cure.

John Hemmings, aged ten years, was admitted a patient of the Bristol Preventive Medical Institution, on the 26th of March, 1804. He had been subject to Epileptic paroxysms for six years; generally terminating in profound sleep. An interval of consciousness sometimes occurred; but this was rarely the case. He appeared stupid and heavy, and upon inquiry, his mental faculties were supposed to be in some degree impaired. The fits, however, now returned less frequently than at their first onset. The father of this boy, now about thirty years of age, had been a cripple from fits for eighteen years past. They began when he was only four years old; they continued for about eight years, frequently recurring, and after a time began to affect his limbs: since the age of twelve he has not been able to walk without the assistance of a crutch; nor, since that time, has he ever had a fit: but on the last day that he ever walked without a crutch, he had twelve or fifteen in succession. The boy's fits occurred about once a week, generally corresponding, according to the report of his friends, with the lunations. A cathartic of jalap and calomel was ordered; and he was afterwards directed to take a half grain pill of argent. nitrat. every night, increasing the quantity by degrees. On the 1st of April, he had a fit, which seemed to be rather less severe than usual: it did not correspond with any change of the moon. On the 17th of April, he was comatose from breakfast to dinner, but no convulsion attended. On the 27th he had a fit, which did not last so long as usual. The pills were still continued, and the affusion of a bucket of cold water was directed every other morning upon his first rising. On the 6th of May, he was desired to omit his pills, and continue the cold affusion. He continued free from fits till the 2d of June; when he had one which did not last above five minutes. He

had another on the 8th, still more trifling, and the family with whom he resided thought his health improved. On the 1st of July, he had a worse fit than usual. Pills of Zinc. Calcinat. were ordered at the next report, and the affusion was directed to be used without regard to his having his cloaths on, in the next paroxysm. He had two fits in the month of July, the dates of which could not be ascertained : the first occurred while he was absent from home. In the second the affusion was administered as directed, and put a stop to it instantly. From this period till the 5th of October, he had no fit. On that day he was seized as usual, the affusion was administered, and he sprang up and ran away. All medicines were directed to be discontinued, and it is believed that he had not taken any pills for nearly a month preceding this date. He continued well till about the 20th of November, when he had a fit while absent from home, and the affusion was not administered. December 21st another fit : the affusion did not stop it so suddenly as before ; it continued about three minutes. His mother observes at this visit that his mental faculties are much improved. A similar fit occurred a few days afterwards, and the affusion was used without effect. He was ordered to resume the pills of Zinc. Calcinat. Feb. 20th a fit less violent than usual, the affusion was not used. Towards the end of March another fit, which was checked as suddenly as ever, by the cold affusion. On the 26th of April, an uncle very imprudently took him to see an execution ; when he was seized with the worst fit that he ever had. May 4th, he had another fit ; the affusion brought him to himself in some degree, but the effect was less decided than formerly.

Upon taking a review of this imperfect case, it would appear, that although the cold affusion when administered during the paroxysm, had considerable influence in abridging its duration, it must not be relied upon alone : for during the interval of the suspension of all medicine, its salutary effects appear to have gradually diminished ; but they again became evident, when it was resumed.

